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Provisional Licensing Programs for Young Drivers

Topical Papers by Licensing Experts,
Including an Annotated Bibliography

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**PROVISIONAL LICENSING PROGRAMS
FOR YOUNG DRIVERS**

**Topical Papers by Licensing Experts,
Including an Annotated Bibliography**

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INTRODUCTION

What follows is a series of papers presented on traffic safety and driver licensing programs effecting young novice drivers.

The first two papers were presented by State driver licensing officials on their States' provisional driver licensing programs at regional and national motor vehicle administrator conferences. The first describes the California program and the other paper describes and presents the evaluation results of the Maryland program. The next two papers summarize the safety benefits of certain provisional licensing activities and describe the graduated approach to initial licensing. They were presented by recognized research and evaluation experts at the Provisional Driver License Workshop, held in Amsterdam, The Netherlands, October 1986. The last paper provides the initial results of a follow-up study of the benefits of the NHTSA sponsored Dekalb County, Georgia, driver education evaluation project, reported at the American Driver and Traffic Safety Association Annual Conference, held in Spokane, Washington, August 10, 1987.

The papers, and an Annotated Bibliography of selected abstracts, are reproduced here as a service to State and Provincial officials and others who have a responsibility for dealing with the traffic safety problems of young novice drivers.

**WORKING WITH TEENAGERS AND PARENTS TO DEVELOP
RESPONSIBLE, SAFETY-CONSCIOUS DRIVERS**

**Luther T. Buchanan, Chief
Division of Driver Safety and Licensing
California Department of Motor Vehicles
Sacramento, California**

**Prepared for
American Association for Motor Vehicle Administrators and
American Driver and Traffic Safety Education Association
Regional and National Conferences 1985**

I want to thank you for the opportunity to participate in this seminar to discuss with you how California is approaching the licensing and post-licensing control of teen-age drivers.

What is Provisional Licensing? Why is it necessary?

Provisional licensing, broadly defined, means a driver licensing system that prescribes certain rigid requirements to which teen-agers must adhere in order to obtain and keep their first California Driver License. Also included in the concept is a post-licensing control provision by which the driver's record is monitored for post-licensing errant behavior, with provision for the application of departmental sanctions to ensure compliance by the young driver with good driving practices. Provisional licensing generally requires the inexperienced new licensee to maintain a safe record and comply with certain driver restrictions during his or her minority. Sanctions, when imposed, are for the purpose of helping the driver form a positive attitude toward the necessity for conforming to acceptable driver behavior patterns. It is reasoned that this approach, operative during the formative years of a young driver's career, will be instrumental in the formation of positive driving attitudes that will remain throughout adulthood. This approach to young errant driver conduct is preferable to the former system of not interacting with the applicant until he becomes a negligent operator. It is our belief that young drivers, whose motoring careers begin under the provisional licensing program will, for the greater part, become more responsible, traffic safety-oriented users of the highways.

A few remarks, by way of background, may help you better understand the evaluation of our California Provisional Licensing Program.

The impetus for considering more comprehensive licensing procedures for young drivers was the high accident and traffic-conviction rates representative of new drivers. Research work carried out at the California DMV in 1971, showed that the 16-and 17-year-old age group of new motorists, when compared to experienced adult drivers, had more than twice the number of accidents in their first year of driving, and had about four times as many accidents per mile driven.

Before the advent of provisional licensing, California's DMV had a two-stage licensing process for all new drivers. Persons 18 years of age and above with no driving experience could then, and can now, apply for a driver license and obtain it the same day. Persons between 16 and 18 years of age must have completed both driver education and driver training to permit issuance of a driver's license. An instruction permit is necessary to obtain the driver training, which is six-hours in duration. An applicant, prior to provisional licensing could, after having received an instruction permit for school practice purposes and completing the driver training course, return to a departmental field office and request the driving test. There was no minimum period required to hold an instruction permit before being allowed to take the driving test.

Two specific study efforts, one reported in February 1980 and the other in April 1982, laid the groundwork for what today is California's Provisional Licensing Program.

The 1980 Study

The original 1980 study documented the development of a Provisional Licensing Program that was later piloted by the California Department of Motor Vehicles.

It was recommended that a limited pilot be conducted with original "minor" applicants to determine the traffic safety effectiveness of the final program model. The primary model involved a "...one-year distinctive provisional license, a youth-oriented driver improvement program, various restrictions for young drivers, the encouragement of parental participation in training new young drivers, driver's manuals for new drivers, and a variety of operational changes, including a mandatory instruction permit." Other options and less comprehensive models with lower, on-going costs were also presented for management's consideration.

This study was partially funded by the National Highway Traffic Safety Administration (NHTSA).

In summary, the function of the 1980 study and report, which was titled: "Development of a Provisional Licensing Program for New California Drivers", was to assess the need for such a program and, in the final analysis, recommend that an actual pilot effort later be scheduled.

The Second or 1982 Study

The second study, known at the 1982 study, was conducted by the Department of Motor Vehicles and was finally reported in April 1982. This study, like the first, was funded by the National Highway Traffic Safety Administration (NHTSA).

The primary objective of this second effort was to produce a provisional licensing system which could be put into operation and subsequently evaluated. The model had to be flexible, allowing for any necessary modifications.

The Model program was produced by:

1. Selecting and hiring project staff.
2. Meeting and conferring with members of the traffic safety community and the public.
3. Designing a parent participation home study manual, improved handbook, and knowledge tests.
4. Developing a specialized criteria for the current driving tests. (This specific secondary objective was not incorporated into the ultimately developed Provisional Licensing Program.)

5. Developing a procedure of certifying actual behind-the-wheel driving practice, and developing a procedure for the production/processing of licensing forms.
6. Developing a novice Driver Improvement Program, tailored to drivers under 18.
7. Developing a distinctive provisional license format.
8. Recommending a program model.
9. Developing an evaluation design.
10. Drafting proposed legislation necessary for program implementation.
11. Conducting a survey to determine if the public would approve the provisional licensing system proposed.

One of the recommendations of the second study was that appropriate legislation be developed to enable implementation of the program.

Senate Bill 483 (Chapter 776) passed both houses of the Legislature and was approved by the Governor on September 7, 1982. The law became operative on July 1, 1983. This bill covered two subjects: 1) provisional licensing and 2) renewal-by-mail. A curfew provision in the Provisional Licensing Bill was questioned by the legislature. In order to ensure passage of the renewal-by-mail measure, the curfew item was dropped from the combined bill; and both items in the bill received favorable consideration.

In a subsequent legislative session, another attempt was made at inserting a curfew provision in the Provisional Licensing Law. This time the issue failed on its lack of merit; it passed the Assembly, but failed in the Senate. While this legislative activity was taking place, the project implementation date was changed to October 1, 1983, to allow for a final decision with respect to the matter of the curfew. With that issue having been resolved, the program became operational on October 1, 1983.

The Provisional Licensing Program was not legislated to be perpetual in nature. It is a demonstration program. The Department must report a result of its statistical findings to the Legislature on July 1, 1986, in the form of an interim report. On or before December 31, 1988, a final report must be submitted. At the time the final report is presented, the Department may either terminate the program or continue it with further evaluations. Future success of the program will largely depend upon the results of the statistical charting of its activities.

How did we implement the program?

The logistics of implementation for this project were the same as would be required for the inauguration of any major addition to California's driver license examining system. Because of its importance, a project manager was assigned full time to make certain that all facets of preparation remained on schedule and that the project would be operational on the appointed date.

The implementation team had to work in many areas in order to guarantee success of the project. New driver license applications had to be printed. This was necessary because, in California, the bulk of the information that appears on the final photographic license must be picked up from the application which, in reality, is the photo document.

Two publications, the Teen Driver Guide and The Parent-Teen Training Aid had to be composed and printed.

Detailed procedures for our field office personnel were needed and had to be written. The Department met its commitment to operate the Provisional Licensing Program on October 1, 1983. All persons who are between 15 and 18 years of age, and who file a driver's license application on or after October 1, 1983, are subject to the Provisional Licensing Program. The minor's application is typed on a special form that bears the preprinted title "Provisional Driver License Until Age 18." The application fee is \$10.00, which is the standard fee for other types of driver licenses. The same preliminary requirements, such as the minimum age to obtain a license, apply equally to the provisional license.

All provisional licenses issued are good for four birthdays from the date of application.. Although the "provisional" aspects automatically terminate when the person reaches 18 years of age, any person desiring to have the provisional reference formally removed from the license subsequent to the 18th birthday must pay a duplicate license fee of \$10.00. The duplicate, which is good for the balance of the unexpired term, is in the format of an adult license.

The Teen Driver Guide is a handbook on the California driving laws and safe driving practices that is the official reading material for those teen-agers coming within the purview of the Provisional Licensing Program. This is the teen-agers' counterpart of the California Driver Handbook, which is given to adult applicants. The Teen Driver Guide is specially written to present safety ideas and the rules of the road to the juvenile population.

The Parent-Teen Training Aid is a companion publication that is given to the teen-ager who qualifies for and receives an instruction permit. It is designed for reading by the parents and/or guardians and describes what the student is expected to learn. Its purpose is to actively involve the parents and/or guardians in the teen-ager's learning-to-drive process. Instructions to the parents regarding what must be covered by the student are clearly set forth in this publication.

New written law examinations were developed for this special licensing effort. They contain 46 questions, of which 39 must be answered correctly in order for the person to pass. This provides for a minimum passing score of 84.78%. (Our regular law examination contains 36 questions, 31 of which must be successfully passed, indicating a minimum passing score of 86.12%.) Although the passing percentage for the teen-age driver is slightly lower than for the adult driver, the test they take covers more material. A point of difference in the two types of examinations exists with respect to test failure. When a "provisional" written test is failed, the teen-age applicant must wait one week before attempting another test. This policy is strictly enforced.

The vision test criteria for processing this type of transaction are the same as for any Class 3 or 4 driver license.

When an instruction permit is issued to a provisional applicant, the person is also presented with a copy of the Parent-Teen Training Aid. When driver instruction is being taken, the accompanying driver must be a licensed parent, guardian, spouse, licensed driving instructor, or licensed adult (25 years of age or older) whose driving privilege is not on probation. We explain to the applicant the requirement for parental participation in the learning-to-drive process.

An applicant possessing an instruction permit issued under the Provisional Licensing Program must have held the permit for a minimum of 30 days before he/she can be admitted to the driving test segment of the examination process. This policy is strictly enforced.

Prior to the minor taking the driving test, the parent, guardian, spouse, or licensed driving instructor must sign the minor's permit certifying that they have covered the points contained in The Parent-Teen Training Aid, which the applicant received at the same time the instruction permit was issued.

The standard driving test has not changed. The same type of test is given to both provisional and adult applicants, and the same scoring system is employed.

If the applicant fails a driving test under the Provisional Licensing Program, he/she must wait a two-week period before another test may be given. This policy is also strictly enforced.

The Department monitors the provisional driver's record closely to achieve improvement in attitude and driving performance of the 16 and 17-year-old drivers before they become negligent operators. The following actions are taken:

1. Suspension of the driving privilege after one failure-to-appear in court.
2. Warning letter sent after first traffic conviction or responsible accident.
3. After the second traffic conviction and/or responsible accident within 12 months, a one-month restriction is imposed. It takes away the solo driving privilege and calls for novice driver to be accompanied by a parent, spouse, guardian or licensed driver (25 years of age or older) any place he or she drives in that 30-day period. These restrictions are imposed by mail.
4. After a third conviction and/or responsible traffic accident within 12 months, a six-month suspension, as a condition of probation, may be imposed.
5. After four or more traffic convictions/or responsible accidents in 12 months, the driver becomes subject to the provisions of the Department's current negligent operator program.
6. Any sanction taken prior to the 18th birthday runs its full course even though the person reaches 18 years of age.

It is very important that the activities of the Provisional Licensing Program be properly monitored so that it may be later determined whether or not this effort has been a success.

As of this time, we are roughly one year and five months into the program. Active data collection is taking place.

The provisional licensing evaluation and data collection system will enable us to assess the effects of the program in two ways. The first involves comparing the records of young California drivers licensed under the historical system (before provisional licensing) with those of young California drivers licensed under the new Provisional Licensing Program (i.e., a simple before/after comparison). The second method for assessing the effects of provisional licensing involves a time series analysis of aggregated accident data for young drivers in California. Time series based on aggregated data for young drivers from one or more other States and for older drivers in California will be used for control purposes.

When the interim report is presented to the legislature on July 1, 1986, it is hoped that a positive trend favoring the "provisional" method of licensing teen-age drivers will then be manifest. With the gathering and analysis of further data until the year 1988, when the final report to the California State Legislature is due, it is our optimistic prediction that provisional licensing will have earned, through statistical validation, a place as the standard modality for preparing the teen-age driver to become a more responsible motorist in today's society.

Addendum

The study entitled: "An Evaluation of The Traffic Safety Impact of Provisional Licensing - Interim Report to the Legislature of the State of California," was published in July 1986. It was reported that the study analyzed data on monthly accidents in California for the period January 1979 through December 1985 utilizing an intervention time series analysis based on the Autoregressive Integrated Moving Average (ARIMA) techniques of Box and Jenkins (1970).

Two age groups were compared in the analysis: 15-17 years versus 24 or more years. Four accident rate types within each age group were analyzed: (1) total accidents, (2) fatal and injury accidents, (3) fatal accidents and (4) single-vehicle accidents. While no significant program effects were found relative to total, fatal, or single-vehicle accidents, there "is suggestive evidence that provisional licensing prevented what otherwise would have been a 13.17 percent rise in the fatal and injury accident rate among 15-17 year olds." The final report, due December 31, 1988, will present a more comprehensive evaluation of the Provisional Licensing Program's impact, including recommendations regarding the permanent adoption, repeal, or modification of the program.

MARYLAND YOUTH LICENSE CONTROL PROGRAM

**Howard McClanathan, Director
Driver Examination and Licensing
Maryland Motor Vehicle Administration
Glen Burnie, Maryland**

**Prepared for
American Association for Motor Vehicle Administrators and
American Driver and Traffic Safety Education Association
Regional and National Conferences 1985**

Introduction

I'm here today to assist in the promotion of the provisional driver's license project for youth under 18 years of age in other states and explain the Maryland Program.

History

Maryland became interested in the 70s to find a way to improve the introduction of its youths entering into the driver license population with some type of a youth driver license program. What was wanted was a means of education and gradual introduction which would reduce:

- The driving violations and subsequent convictions;
- The accident rate for day and night-time driving, and
- Involve parents or guardians in the training.

National accident figures indicated drivers under age 25 represented 22 percent of the total drivers and were involved in 39 percent of the serious and fatal accidents.

Maryland figures paralleled those of the Federal Government. In the year 1978, 36 percent of the fatal or serious accidents in Maryland involved the under 25 year old driver, while that group represented only 22 percent of the total drivers.

Drivers less than 18 years were well represented in this group. They were 4 percent of the total drivers and had 6.5 percent of the accidents while traditionally being low mileage drivers.

It was believed by instilling good driving habits in the up to 18 years of age group there would be a carryover to the older group of 18-25.

Preliminary planning began in October of 1977 through June of 1978. Maryland was awarded a contract by the National Highway Traffic Safety Administration (NHTSA) to set up a program to provide drivers with an opportunity to acquire safe driving skills under ideal conditions.

Maryland, at the time, had a requirement that all under 18 years of age applicants must have completed a drivers education course of 6 hours laboratory and 30 hours classroom instruction. Driver education instructions could be given to any student who was 15 years of age or older.

The drivers education program was funded up to \$65 of the cost by the new license and or learners application fees. This enabled all under 18 years the opportunity to afford and obtain the drivers education requirements.

In addition, a law had been enacted permitting the assigning of a minor to the driver improvement program for a conviction of a violation of the motor vehicle law.

Next we looked at our needs -- the administration, in order to make the provisional license program a viable program, needed legislation for the following:

- A separate license (a provisional license so the operator could easily be identified and to give them a desire to achieve the goals of the program and eventually to obtain a regular drivers license).
- Night-time curfew restrictions - to remove the operator off the highway during unfavorable operating hours.
- A means to involve parents in the supervision of practice driving.
- A youthful driving improvement program and penalties for those who received convictions for violations during the provisional period.

The 1978 legislature complied with many of our requests and the provisional license laws were signed into effect in May of 1978, effective January 1, 1979.

The new law provided for a Provisional License for all new drivers under 18. Maryland chose to issue the Provisional License to only those who obtained a class D License which includes passenger car and small trucks up to 25,000 lbs. gross vehicle weight.

- The drivers education requirement was retained.
- A restriction from driving on a Provisional License from 1:00 am - 6:00 pm was imposed unless the driver was accompanied by a licensed driver over 21 during the restriction hours.
- A waiver was permitted for those who worked or needed to drive for educational purposes during the restricted hours.
- Legislation provided for the issuance of a regular drivers license after 6 months of driving without a conviction or at age 18. The license conversion from a Provisional to a regular license was and still is free of charge.
- The learners law was changed permitting the obtaining of a learners card at 15 years 9 months instead of 16 years. This did two things:
 - It gave the new applicant the opportunity to learn to drive under parent supervision 90 days before being able to obtain a license. Normally, a first test can be taken after 14 days.
 - It brought the parent teaching nearer to the driver education program if the course was taken at the minimum age of 15.

Other needs were handbooks for parent instruction. The handbooks were developed by the National Public Research Institute for the State of Maryland, again under contract from NHTSA.

The first handbook was given out when the parent came in and gave consent for the minor to drive. The handbook was called "How I Learned To Stop Worrying, Save On Repair Bills, Keeping My Insurance Rates Down, And Loving Every Minute Of It By Helping My New Driver Practice Safe Driving."

- Getting Ready - Seat, Mirror Adjustment, Instrument Panel.
- Maintain proper following distance - The two second interval is explained and practiced.
- Using mirrors and recognizing blind spots.
- Selecting proper following speeds, looking ahead.
- Proper lane positioning by observing traffic, markers, hazards on left and right side of vehicles.

The handbook is written in the context of the parent actually teaching, guiding and observing. In the back of the book was space for a practice time log.

The second book was issued when the youth became a Provisional Driver. It was entitled "How I helped my new driver continue practice safe driving in more difficult driving situations." It covered:

- Night driving
- Freeway and expressway driving
- Inclement weather
- Handling emergencies
- Efficient driving techniques

It also had a place in the back to record practice time.

There was also a need to set up a youth drivers license clinic.

- It was determined that from the number of violators expected, it would be too expensive to send all of them to an 8 hour clinic; therefore, we opted for a safety booklet mailed to their home, to be read at home, with a test to follow at a local branch office. 80 percent would be a passing grade.
- Those who failed the test, and those who received a second conviction, would be assigned to attend the new youth drivers clinic for 4 - 2 hour sessions.

The clinic sessions included:

- Session 1 - The introduction to the clinic and adjusting speed.
- Session 2 - Common driving situations, keeping a margin of safety.
- Session 3 - Hazard recognition and driving emergencies.
- Session 4 - Safety Belts, Alcohol and the final examination.

Three films were used: "Staying Alive," "Seat Belts a Smashing Success" and "Five Drinking Drivers."

Provisions for the waiver of restricted hours were set up for employment and educational purposes.

To obtain a waiver, a letter on the employer or instructor's letterhead must be submitted to the administration. The contents must include name of supervisor, work number, name of applicant, license number and work permit number, if applicable, and the days and hours the waiver was needed.

Before a waiver is issued, the supervisor is contacted to verify all the information by phone.

The Federal Contract of the Provisional program was for 4 years beginning January 1, 1979.

The performance of the contract was affected by many variables, some unforeseeable.

- Short supply of oil.
- Driving population on the decline.
- Escalating prices cutting unnecessary driving and vehicle purchases.
- Number of students available in many areas was insufficient to hold a clinic class.
- The lack of legislation to take action against provisional licensed drivers whose parents did not participate in the training, those who failed to take the test for first conviction or attend the youth driver license clinic.
- The hours of restriction were not of sufficient duration since the restricted hours were only from 1:00 am - 6:00 am. Before the demonstration there were only about 200 accidents per year for this age group. The restriction desired was from 10:00 pm - 6:00 am.
- Police responsibility of accident reports in Maryland was less due to other priorities.

The results of the pilot program are presented below:

**EXHIBIT 1
PERFORMANCE MEASURES**

<u>Measure</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Parent Certificates Collected	21,096	21,108	N/A	N/A
Learner's Permits Issued	61,397	59,312	52,066	51,946
Provisional Licenses Issued	53,333	53,889	51,810	46,357
Curfew Waivers Issued	196	234	218	238
Provisional Licenses Extended	2,236	3,714	2,346	N/A
Driver Improvement Tests Given	0	1,368	2,063	110
Driver Improvement Classes Given	0	0	24	14

Conclusions

The conclusions of the program are:

- Provisional Licensing Program Feasible
- Parent-Supervised Driving and Youth Driver Improvement Program (YDIP) not Assessable
- Nighttime Driving Restrictions (1:00 am - 6:00 am) Ineffective
- Convictions Reduced up to 20%
- Accidents Possibly Reduced up to 10%

Recommendations

The recommendations to the State of Maryland are:

- Continue Provisional License
- Extend Nighttime Restriction
- Modify Youth Driver Improvement Program
- Consider Instructional Requirement
- Consider Parent-Supervised Instruction

The national recommendations are:

- Encourage Provisional Licensing
- Encourage Parent-Supervised Instruction
- Study Nighttime Restriction
- Study Instructional Requirement

Addendum

The Provisional license program has continued in Maryland as a result of the pilot program. We have now extended our learners permit to 6 months since the 90 day permit expired for many who obtained them at 15 years 9 months before they could appear to be tested. This change was effective July 1, 1983.

Changes effective January 1, 1985, resulted in:

- Waivers now being issued for employment purposes only.
- The restriction period for driving accompanied by a licensed driver over 21 has been increased to 12 midnight to 6:00 am (1 hour more).
- The period of time a youth must hold the provisional license has been increased from 6 months to one year for conviction free drivers.
- Provisional drivers as well as all other drivers under 18 began receiving a profile photo on their drivers license.

Effective July 1, 1985, all applicants under age 21 year were required to be photographed in the profile.

In addition, Maryland began issuing provisional licenses to new class (E) motorcycle operators and class (B) large straight truck license holders which are the other 2 classes permitted to obtain a license at age 16. To drive a bus or a combination vehicle, you must be 18.

Something that may be of some interest to other States looking into the provisional license is that of all Maryland learners license issued, only about 18 percent are issued to applicants under 16 years.

SAFETY EFFECTS OF PROVISIONAL DRIVER LICENSING PROGRAMS

**A. James McKnight, President
National Public Services Research Institute
Landover, Maryland**

**Prepared for
Provisional Driver License Workshop
Amsterdam, The Netherlands
October 1986**

I would like to talk to you this morning about some of the research which has been done in evaluating provisional license programs and the ways in which it appears that provisional licensing may effect the safety of young drivers.

One way in which provisional licensing affects safety is by limiting the exposure of young drivers. Eventually, drivers must be exposed to all the hazards of the highway environment; but not while they are learning. If we can control their exposure initially, we can help them to survive this learning period. By the time they face all the hazards of the highway environment they should be able to cope with them.

The second way provisional licensing can effect safety is by motivating drivers to operate within the law, and thus to operate safely, while they are learning. Certainly, we wish drivers to be motivated to operate safely at all times. However, the period when they are first learning is no time to be taking chances.

The third way a provisional license can effect safety is by leading to further education. We recognize when people obtain a drivers license, it is really a license to learn how to drive. The tests that people must pass to obtain a license certainly do not establish their qualifications to drive, but merely their ability to operate a car in a way that probably will not kill somebody while they are learning to drive. A Provisional License provides a means of inducing young drivers to obtain more instruction after they've received their licenses.

Reducing Exposure

The first effect is reducing exposure. There are several ways that can be done. The way that is most often done in the U.S., is by a nighttime driving restriction called curfew.

Risks are greater at night. We can reduce risk by keeping young people from driving at night until they have learned how to drive during the daytime. There are other restrictions that have been applied. One is allowing youngsters to drive only with a parent. Patricia Waller mentioned this in the morning session. She wants to make it clear that she was not talking of parents as teachers but merely parents as supervisors to help reduce the threat to young drivers while they are learning to drive. There are also restrictions that prevent young drivers from operating in big cities. There are several states in which the provisional license only allows young people to drive back and forth to school or if they live on a farm, from the farm to the school.

But the most common restriction is the curfew. I will present some results that were analyzed by Dave Preusser at Dunlap and Associates for the Insurance Institute for Highway Safety. What you see here are the results obtained in Pennsylvania.

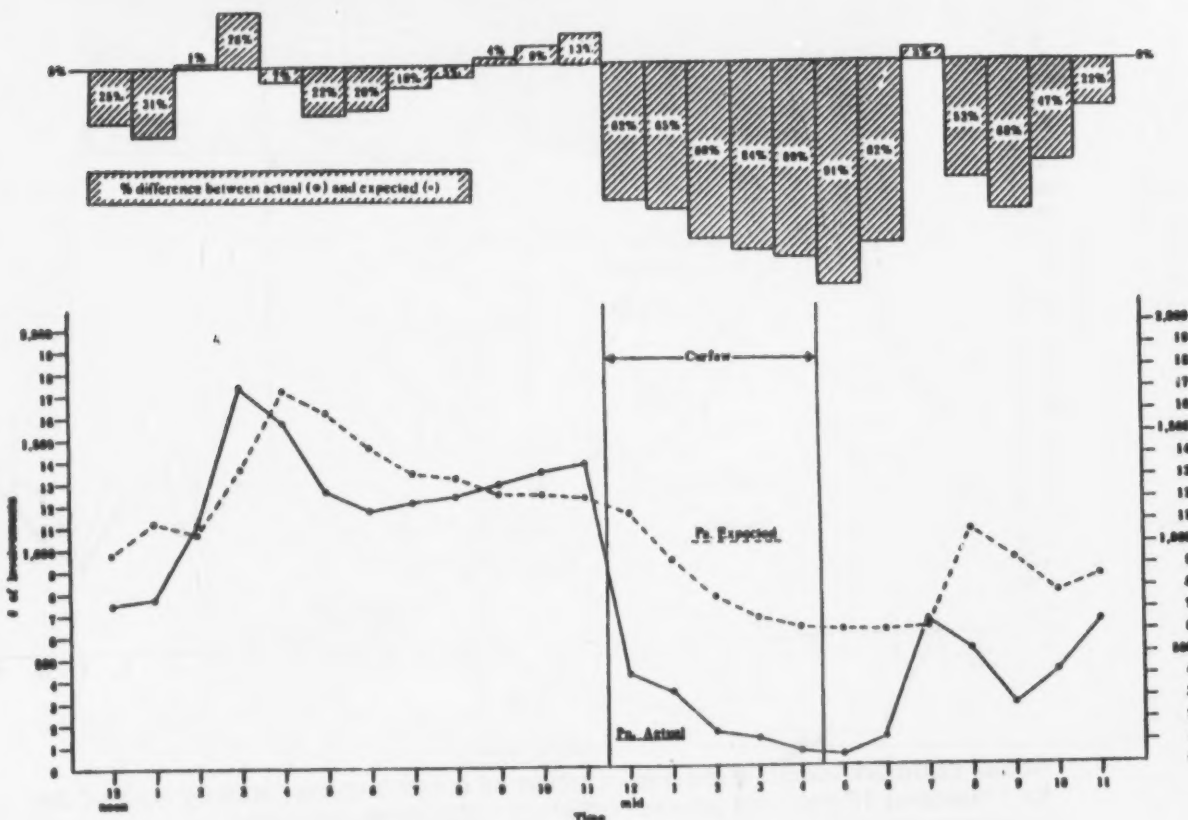


FIGURE 1
Actual versus expected crash involvement by hours of day for Pennsylvania 16 year old drivers based on relationship between Pennsylvania and Ohio 21-24 year olds and numbers of crash-involved 16 year old Ohio Drivers (1978-1980).

The "expected" line is what would be expected of people in the age range affecting 16 year olds during various hours of the day. The "expected" was obtained by (1) obtaining data from a neighboring state, Ohio, (2) looking at the relationship between accidents of sixteen year olds on one hand and older people (21 to 24 year olds) on the other, (3) developing a regression equation based on those data, then (4) taking the accident data of 21 to 24 year olds in Pennsylvania and predicting what the accident rate should have been for sixteen year olds in Pennsylvania. You can see that throughout the daylight hours the expected is pretty close to what actually occurred. But during the nighttime hours the actual accident rate is much lower than what was expected. On the basis of this, they concluded that in Pennsylvania the curfew was effective in preventing nighttime accidents.

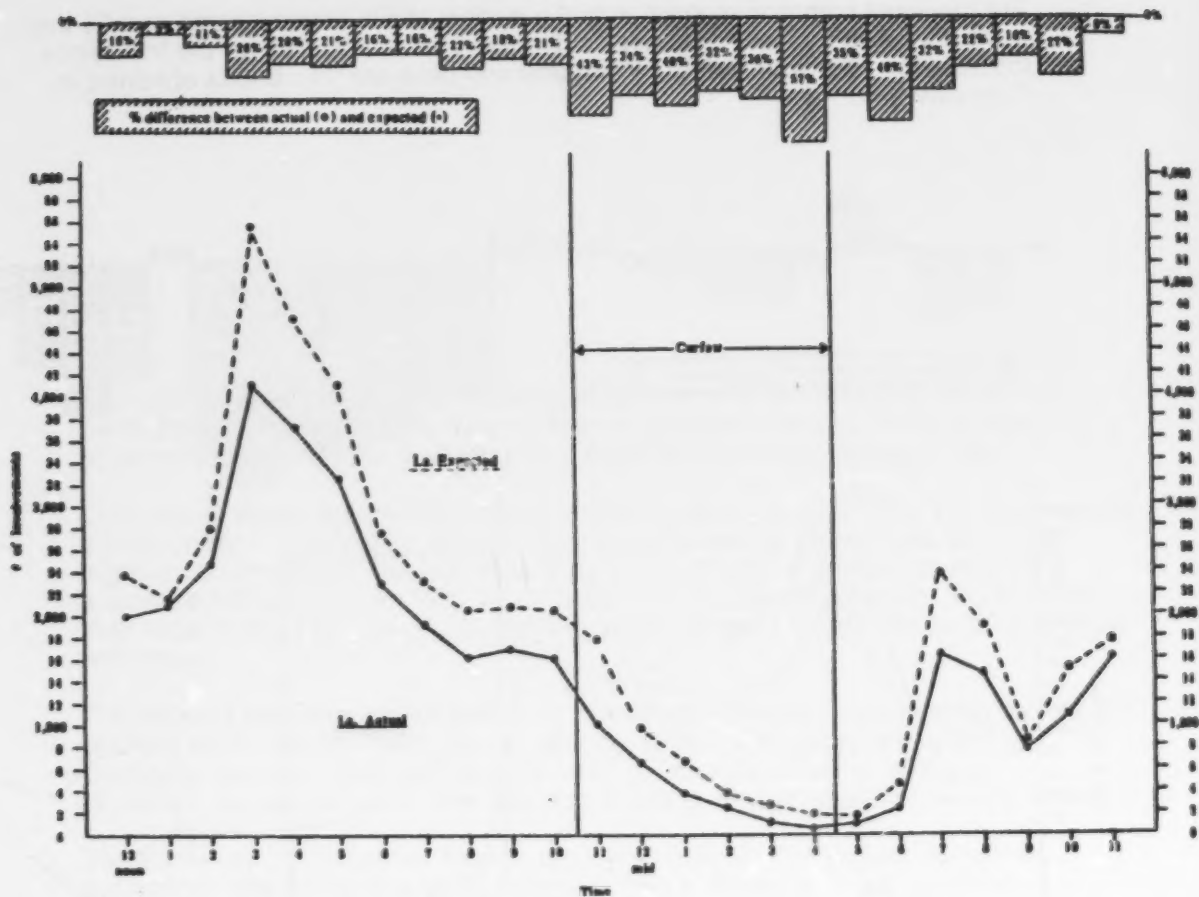


FIGURE 2

Actual numbers versus expected numbers of crash involvements by hour of day for Louisiana 16 year old drivers based on relationship between Louisiana-Mississippi 21-24 year olds and numbers of crash-involved 16 year old Mississippi Drivers (1976-1980).

This is the result from Louisiana. The analysis was very similar except that the state they used to develop the regression equation and predict accidents for 16 year olds was the neighboring state of Mississippi rather than Ohio. The results are certainly not as dramatic. One of the problems is, as you can see, the accident rate for the Louisiana young people was lower during the daytime as well as in the evening. They concluded this was evidence in favor of the curfew. I would like you to judge yourself whether this is evidence of the effect of the curfew or just simply that younger people drive more safely than older people in Louisiana as compared to Mississippi.

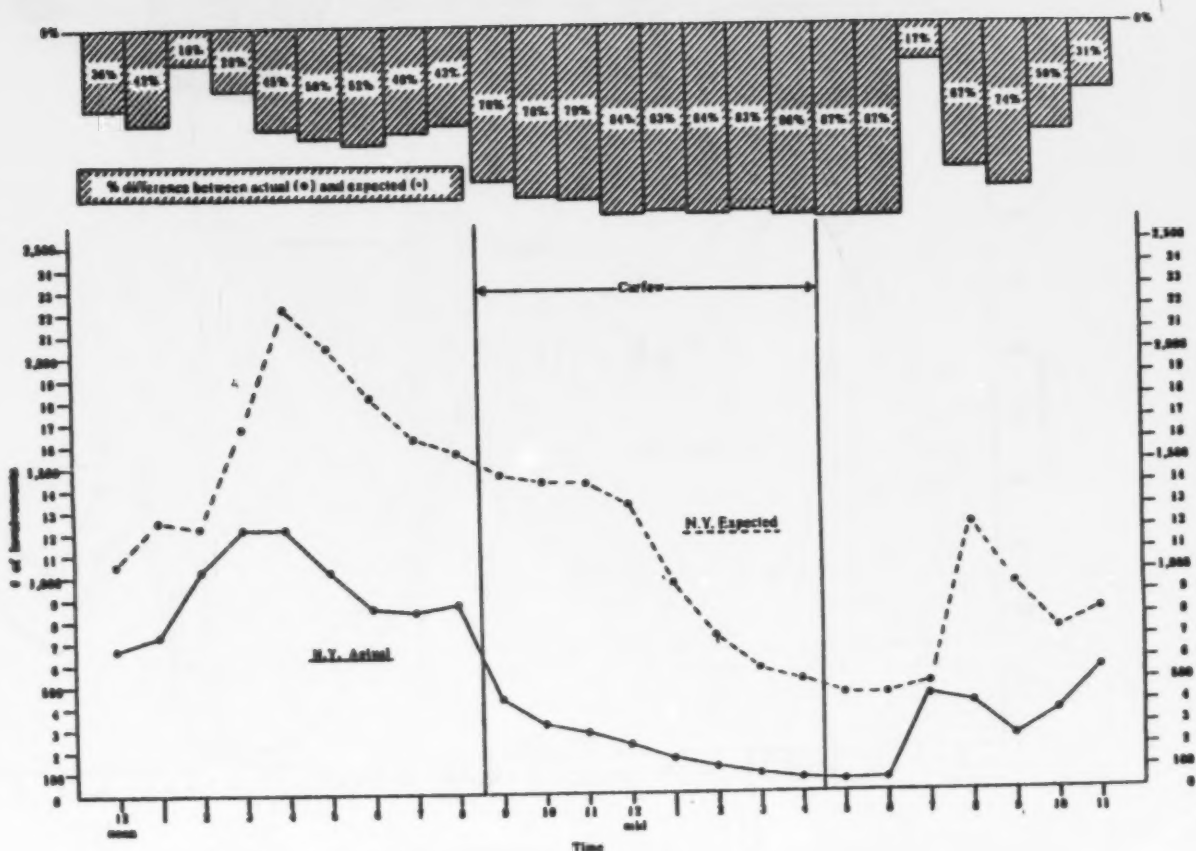


FIGURE 3
 Actual number versus expected numbers of crash involvements by hour of day for New York 16 year old drivers based on relationship between New York-Ohio 21-24 year olds and numbers of crash-involved 16 year old Ohio drivers (1978-1980).

In New York, accidents at night were lower than expected. But there again we can see the decline is almost as great during the day as it is at night.

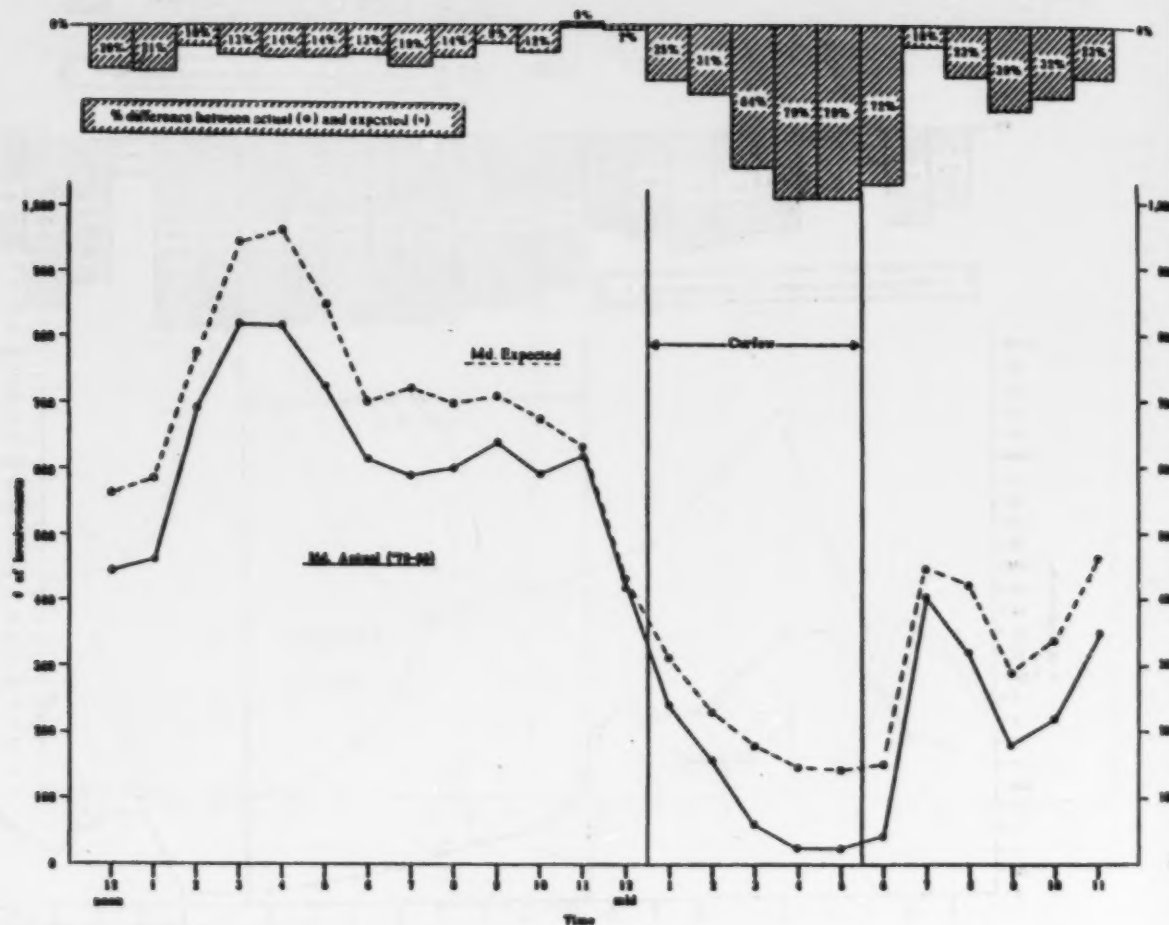


FIGURE 4

In Maryland, they preferred a different analysis. The curfew law had just recently been passed in Maryland so they had data both before and after the curfew. Rather than compare Maryland with some other State, they predicted on the basis of the relationship between young and old before the curfew, what it should be after the curfew. Again, there is a big difference at night but also some difference during the daytime. The results as to the effect of a curfew are somewhat equivocal.

One of the problems in the Maryland analysis is that they simply made a before-and-after comparison. We were concerned because the relationship between accidents of young people and old people has been shifting greatly over time. The question is whether the drop in night accidents is due to the curfew or whether it reflects a continuing trend. So we did another study in which we looked at the time series of accidents for four years before the curfew went into effect and four years afterwards.

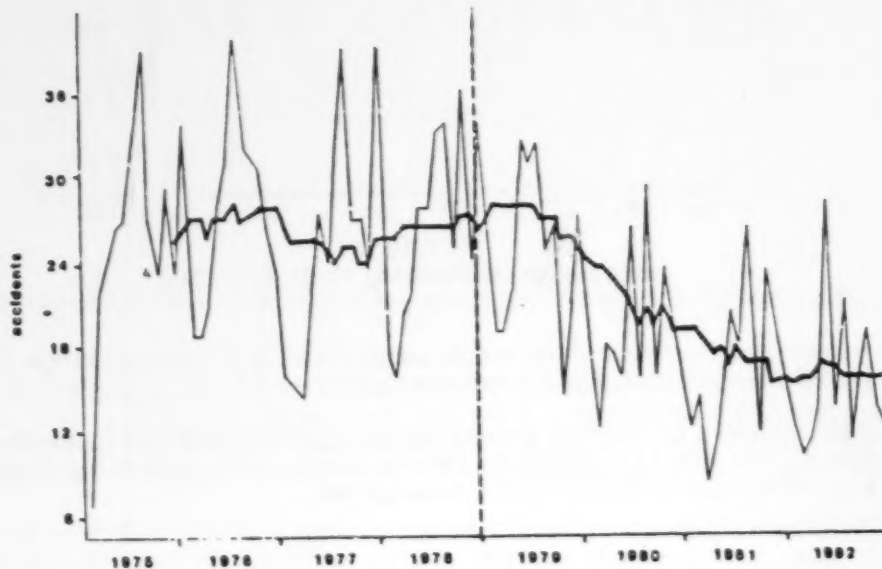


FIGURE 5
Night Accidents Involving 16-Year Olds

Here are nighttime accidents for 16 year olds in the State of Maryland. You can see that the accident rate went down when the curfew went into effect. However, the curfew took effect in one year; the continuing drop afterwards had nothing to do with the curfew. What happened was that the police changed their threshold for investigating accidents because of economic conditions. They were less likely to go out and investigate any accidents, nighttime or daytime. Actually they are more likely to investigate nighttime accidents than daytime accidents because nighttime accidents are the more serious accidents. But there was a drop in all kinds of accidents during that period.

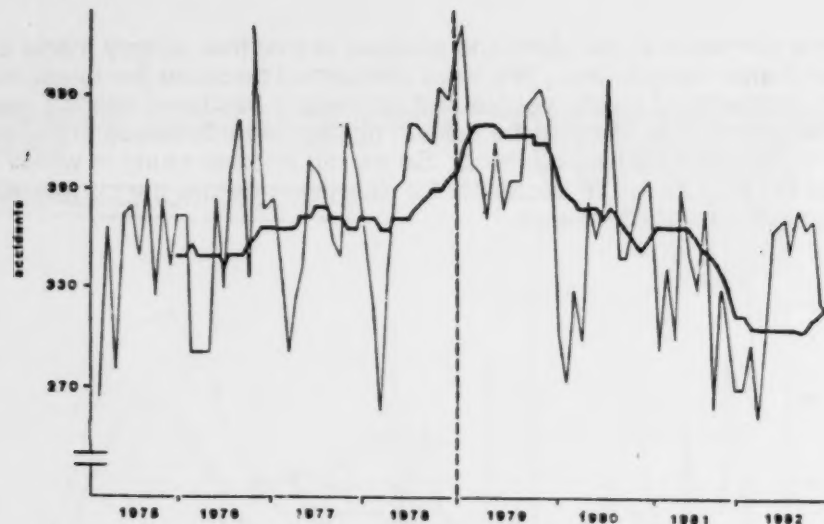


FIGURE 6
Night Accidents Involving 18-21 Year Olds

Here are the nighttime accidents for people in the 18 to 21 year old range. You can see it is very similar. But it is not exactly the same.

In order to make a comparison we divided the nighttime accidents by daytime accidents. This helped to control for differences due to changes in numbers of drivers, differences in accidents and investigations.

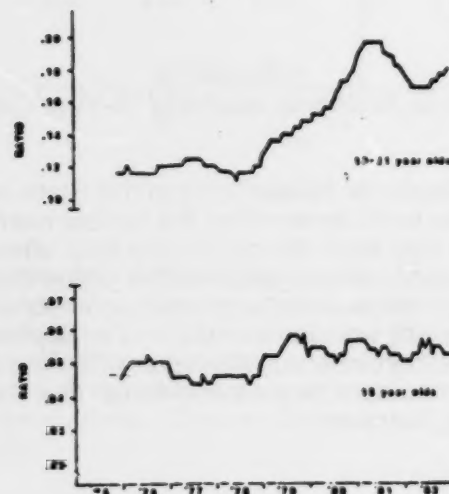


FIGURE 7
Night, Day Accident Ratios for Ages 16 and 18-21

We can see that the time series for the 16 year olds are pretty level. But for the 18 to 21 year olds the night to day accident rate went up. We then took the night to day accident ratios for the 16 year olds and divided them by the night to day ratio for older drivers. The "ratio of ratios" appears in the next figure.

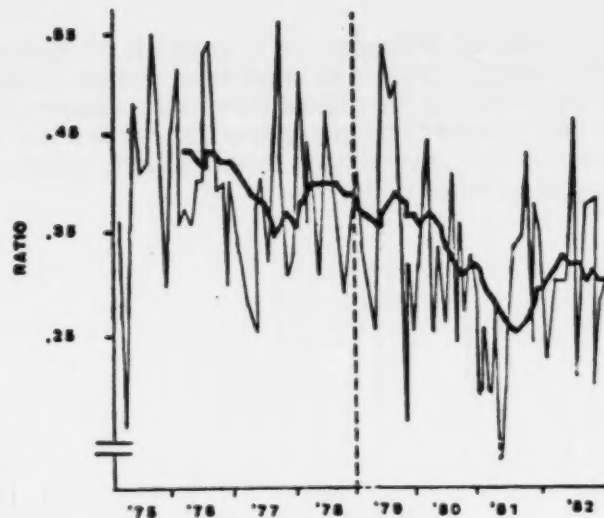


FIGURE 8
Ratio of 16-Year Olds Night/Day and 18-21 Year Olds Night/Day Accidents

Notice the years before the curfew shows more accidents than the period just after. This is what the Dunlap study reported. They showed a slightly greater drop in accidents at night than in the day. But there is a continuing linear trend straight down hill from 1975 to 1982. And that trend easily explains the change.

We did a multivariate time series analysis where we created a model of the expected effect of the nighttime curfew. We took the number of people who were subject to the curfew during the year 1979 and created a model of that. Then we cross-correlated that model with this whole trend and found that there was no relationship. In other words in Maryland the curfew had no effect.

Now this does not mean that curfews have no effect. In Maryland the curfew was from one a.m. to five a.m. It affected very few people; the types of people who were driving from one to five a.m. are apparently not the kind of people who are likely to be intimidated by a change in the law. You noticed in the States like Pennsylvania and New York there may have been some effect. There the curfew started at 11 o'clock in the evening. The point is that if you are going to have a curfew don't have it only in the hours of the morning in which young people are not driving anyway. Start at about eleven o'clock or it is not worth having.

Motivating Safe Driving

Lets go on to the second effect talked about. That is the motivational effect. In many States, including Maryland, the provisional licensing period law could be extended if there was a traffic violation. The purpose of that is to motivate drivers to avoid traffic violations. It is coupled with the curfew. The curfew is important because if there is no restriction placed upon their driving then why would they care whether they have a provisional license or a regular license? They could drive a car with a provisional license until they are 18, then it automatically becomes a regular driver license. They wanted to avoid extending the provisional license in order to avoid the curfew.

There could be any kind of restriction, as long as it is obnoxious to the driver. The driver improvement program was another kind of an undesirable element of the program. They knew that the minute they had a violation they would be subject to driver improvement action and they did not like that either. If the driver improvement program motivates drivers to avoid traffic violations there should be more safer driving at all times of the day.

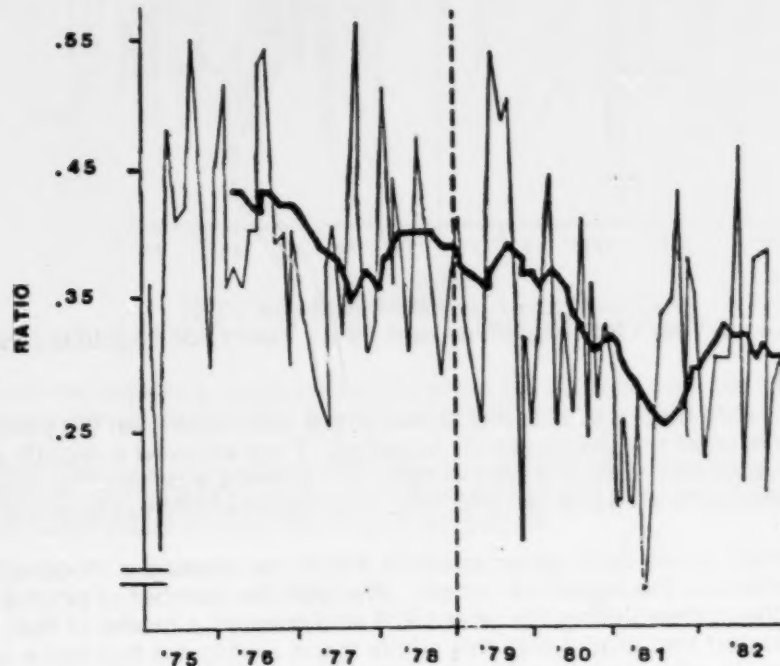


FIGURE 9
Ratio of 16 to 18-21 Year-Olds Convictions

Here is the conviction ratio of 16 years olds to 18 to 21 year olds, during the period leading up to the intervention, the intervention, and the period after the intervention. It is just simply the conviction of 16 year olds as a ratio of convictions of people 18 to 21 years old. As you can see the ratio dropped markedly. There was a high correlation between that drop and the model of the expected effect. There is a significant drop somewhere in the neighborhood of 10 percent.

It appears that the major function of the nighttime curfew was not to reduce nighttime driving but to reduce convictions by its ability to motivate people who want to get their regular drivers license to drive lawfully. That reduces their convictions. Does it have any effect on accidents?

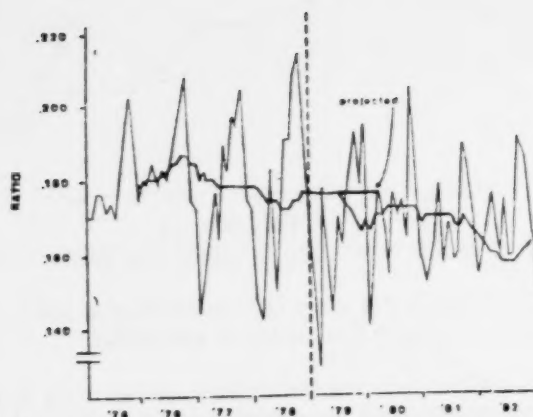


FIGURE 10
Ratio of 16 to 18-21 Year-Olds Daytime Accident

Yes it does. Not as a pronounced effect, but a 5 percent drop. Note that accidents also went back up. Does that mean the effect is wearing off? No, there are trends up and down the line, due to economic conditions. The drop occurred precisely during the first nine months of the provisional license, which the model would have predicted. So it did appear to have effect upon convictions and there is a secondary effect upon accidents. The people were not necessarily motivated to drive safely but to drive lawfully. That had a secondary effect upon accidents.

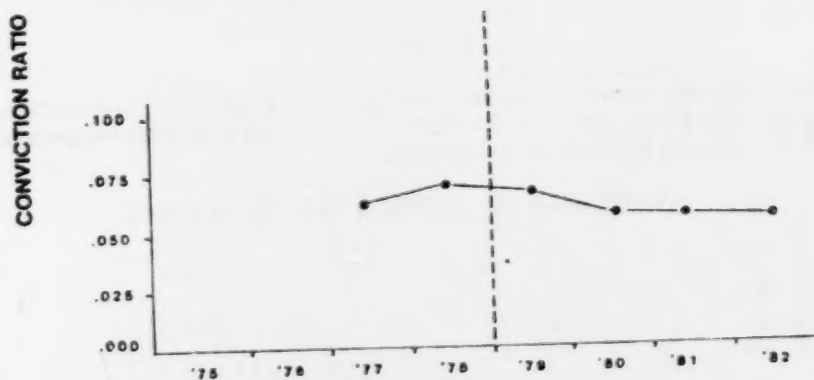


FIGURE 11
Ratio of 16 to 18-21 Year-Olds Convictions: Virginia

Was the drop due to the provisional licensing program or something nationally. We looked at the same kind of data from Virginia. We did not have monthly data from Virginia only annual. And here is the 16 to 21 year old conviction ratio in the State of Virginia; you see no drop there. The drop in convictions had to be something that occurred only in Maryland and the only thing that happened in Maryland at that time was the provisional driver license law.

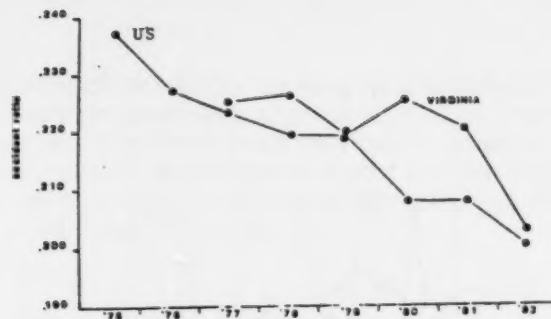


FIGURE 12

Ratio of 17 to 18-21 Year Olds Daytime Accidents: FARS and Virginia

This is the accident ratio in the state of Virginia and in the U.S. And again it shows no drop comparable to that found in Maryland.

In summary, a provisional license law does seem to have a motivational effect when you couple a curfew with the requirement that driving records be violation free in order to get a regular license.

California had a similar provisional licensing program in that driver improvement criteria were somewhat lowered.

CALIFORNIA PROVISIONAL LICENSE

OFFENSE

ACTION

First

Warning Letter

Second

Must be Accompanied by Adult

Third

Six-Month Suspension
One Year Probation

FIGURE 13

Under the California system, a second violation and they must be accompanied by an adult. When they get a third violation the license would be suspended. This was to motivate them to drive lawfully.

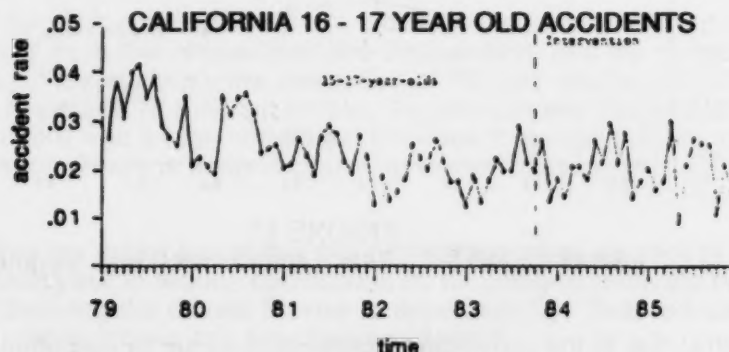


FIGURE 14

These are data that I took right out of the California report. This is the 16 to 17 year olds and it is just their accidents. You see there is no drop when the law went into effect. That does not look very promising by itself. It does not seem to have any effect.

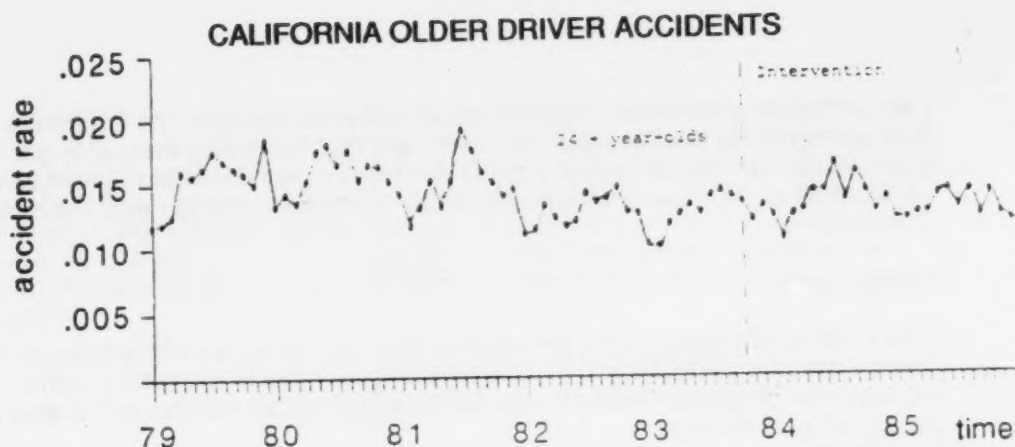


FIGURE 15

But look at the older population. There is, at the point of intervention, an increase. This may be due somewhat to an economic recovery. People were able to drive more. Accidents begin to go up in 1984.

California did two separate univariate time series analyses. There was an increase in accidents among adults. Among the younger people there was no increase. And on the basis of that they concluded that the effect of their program was a 13 percent reduction in accidents because there was practically no increase among the 15 to 17 year olds and a 13 percent increase among the 24 year olds and up. They attributed a 13 percent increase to the program.

That may be true but I'm not sure. I took the data and divided young driver accidents by older driver accidents and created my own time series, which looks something like this.

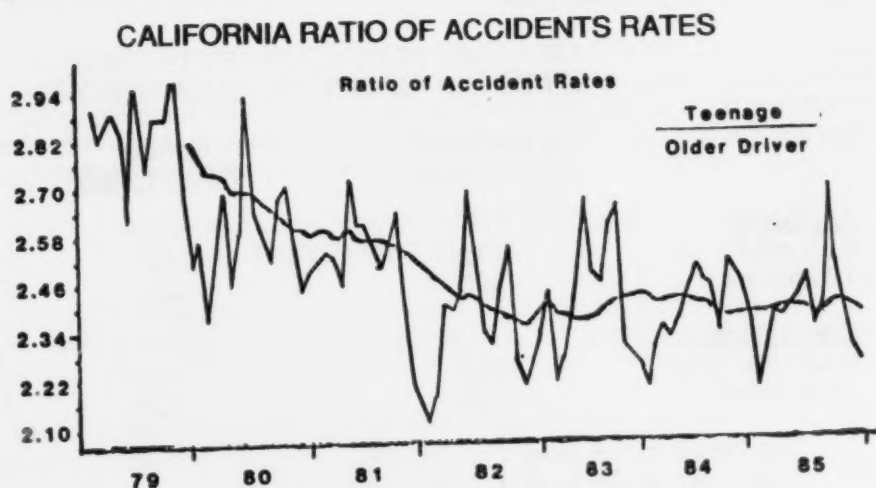


FIGURE 16

When the program goes into effect, what should happen is the ratio of teenaged to older drivers should have dropped. I don't see it. So use your own judgment. I think the results are still questionable. When you find an effect by showing a significant change in one group and no significant change in the other, and not a significant difference between the two, one is on dangerous ground in concluding that the two differ.

I would like to emphasize the difference in the restriction. The California program had no nighttime driving restriction. Drivers had no strong motive to get off a provisional license. In fact, if you did not have a traffic violation you had no restrictions at all. There was no particular motivation not to keep a provisional license.

Education

The state of Michigan had a provisional license. What we did is change the driver improvement criteria. If you had three traffic violations you had to come in for an educational program. While it was called a "group reexamination" it was really a safety education course.

Michigan Probationary License Group Re-Examination Study

**Treatment Group--Immediate Assignment to
Group Re-Examination**

Control Group--Assignment Delayed One Year

FIGURE 17

What they did under the provisional license study was reduce the criteria so that two traffic convictions or one four point conviction would bring you in if you had less than one year or driving. And from one to three years it was six points or one four point conviction. That was much less than it was for the older drivers. They did a random experiment in which the treatment group was immediately assigned to a group re-examination when they met those criteria. The control group was delayed for one whole year.

MICHIGAN PROBATIONARY LICENSE EFFECT OF GROUP RE-EXAMINATION

	Treatment (N = 11,392)	Control (N = 11,482)	Difference
<u>Accidents</u>			
6 Months	.172	.184	.012*
12 Months	.320	.327	.007
<u>Convictions</u>			
6 Months	.392	.432	.040**
12 Months	.754	.820	.066**

* Significant at .05 level

** Significant at .01 level

FIGURE 18

Here are the results. First, the accident rates. At the end of six months there was a significant difference between the treatments and controls. The treatments had significantly fewer accidents. However, it disappeared by twelve months. Among convictions there was a significant reduction both at six and twelve months. So, bringing people in to educate them did appear to have an effect.

There are other ways to educate people and one is to give young people the experience of being without a drivers license through a short term suspension --- not long enough to qualify as a time suspension, but long enough for the driver to get an idea how inconvenient it is to be without a license. And there is one advantage of experience over formal education; it is a whole lot cheaper. It costs relatively little to send drivers a letter to tell them their license is suspended. We ran a study comparing licenses suspension with an educational "group interview" program.

MICHIGAN PROBATIONARY LICENSE TWO WEEK LICENSE SUSPENSION STUDY

<u>Violations</u>	<u>Treatment</u>	<u>Control</u>
First	Warning	Warning
Second	Group Re-exam With Threat of Suspension	Group Re-Exam With Threat of Suspension
Third	Suspension	Interview

FIGURE 19

What we did is when the people came in for a group re-examination, one group (control) told: one more violation and you have to come in for a hearing. The treatment group was that on the next violation they would get the license suspended. Now we could not suspend it for very long, not at that low level. But the hope was that a two week suspension would expose the inconvenience of not having their own license and might have a beneficial effect.

This is how it worked. Everybody got a warning first. On the second violation the suspension-group got a group re-exam and a threat of suspension. The control group got a group re-exam and only a threat of a hearing. On the third violation the suspension-group got suspended and the control group just got a "hearing" in the form of a group educational interview.

MICHIGAN PROBATIONARY LICENSE TREATMENT LEVEL

	<u>Treatment</u> <u>(N = 6,681)</u>	<u>Control</u> <u>(N = 6,706)</u>	<u>Difference</u>	<u>P</u>
<u>Males</u>				
Accidents	36.9%	36.9%	--	>.10
Convictions	65.6%	66.5%	.9%	>.10
<u>Females</u>				
Accidents	23.8%	28.0%	4.2%	.01
Convictions	41.5%	44.8%	3.4%	.04

FIGURE 21

I wish the results were a lot more clear cut than they are. Among the males at the threat level, (after they came in and were threatened) there does not appear to have been any effect upon accidents or convictions. The threat that the next violation is going to result in your license being suspended, had no apparent effect upon the males. It does appear to have had some effect on the females. It had a significant effect upon their accidents, and a marginal effect upon their convictions. The threat seems to have had a greater effect on females than on males; females seem to be more easily intimidated by threats than males.

MICHIGAN PROBATIONARY LICENSE ACTION LEVEL

	Treatment (N = 3,506)	Control (N = 3,548)	Difference	P
Males				
Accidents	27.3%	29.1%	1.8%	.05
Convictions	57.8%	59.5%	1.7%	.07
Females				
Accidents	16.5%	19.4%	2.9%	.10
Convictions	39.8%	40.5%	.7%	>.10

FIGURE 22

Now lets look at the people who actually did get their licenses suspended. Among the males, there was a significant drop in accidents and convictions. The threat did not work but actually having their license suspended appears to have worked. Among the females, there was a sizable reduction in accidents. But because the female population was much smaller, this difference was not significant. Among convictions you can see there was practically no effect. So, those females who were not intimidated by the threats, did not seem to be effected by the actual suspension. Those among the males who were not intimidated by the threat, did seem to be effected by the act of suspension itself. The males had to experience it, the females only needed to be threatened by it.

There is one element of education which I would like to see evaluated. We cannot, because no one has ever employed it. That is the idea of introducing additional driver education after a license is given. If any of you have observed in-car driver education instruction you realize students have great difficulty just keeping the car on the road. They cannot attention share between controlling the car and absorbing the safety information instructors are trying to give them. You cannot attention share between tasks until one is reduced to a routine. While they are still devoting their attention to keeping their car on the road, it is very difficult for them to absorb safety information. It might be better to let them have a license, go out and drive for a while, and then come back. A provisional license will allow you to do that. Right now, we give them a license and you will never see them again. Why would they come back, if they have a license?

The other advantage of driver education after licensing is that much safety information is meaningless to people who don't drive. They don't really understand what they are being told because they've never experienced the situations. Therefore, a lot of the instruction that is given to young people that have never been behind the wheel before is wasted.

Let me sum up by addressing three impacts of provisional licensing that Mr. Veling will talk about this afternoon. The one effect is reducing exposure: There appears, as far as a nighttime curfew is concerned, to be a slight beneficial effect so long as the curfew is long enough. The second effect, motivational effect of having to have a violation free record before you get a regular license can lead to safer driving. The third effect is that of educational programs, both positive and negative forms. People who have violations are forced to participate in some type of educational program seem to have fewer accidents than violators that don't have to participate. One element we have not been able to evaluate is education not just for the traffic violator but education required during the provisional license program for all people. That has not been done and we have not been able to evaluate. Thank you.

A GRADUATED LICENSING SYSTEM FOR BEGINNING DRIVERS

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INTRODUCTION

Driving may be the most widespread complex psychomotor task engaged in by the public.

Crashes represent a failure of the system, and studies report that when crashes occur, in the vast majority of cases there has been a failure on the part of the vehicle operator. While there are serious shortcomings in the studies claiming that human error is the major culprit in vehicle crashes, the fact remains that drivers are not adequately trained or qualified to enter the driving population at an acceptable level of skill. In light of the significance of driving in our society, and in light of the enormity of the motor vehicle injury problem (Hartunian, Smart, and Thompson, 1981; National Academy of Sciences, 1985), it is astonishing that so little attention has been given to how drivers might best be prepared for a lifetime of driving.

Overrepresentation of Young Drivers in Crashes

It has long been recognized that young drivers are vastly overrepresented in motor vehicle crashes and injuries, whether the measure of exposure is based on population, number of licensed drivers, or miles driven (Jonah, 1986). Indeed, the U.S. motor vehicle injuries are the leading cause of death for young people between the ages of 15 and 24 (U.S. Department of health, Education, and Welfare, 1979). Because motor vehicle injuries strike the young so disproportional, the societal costs of motor vehicle injuries are second only to those of cancer (Hartunian, Smart, and Thompson, 1981).

Driver Education

In recognition of the inordinately high crash rates of young drivers, driver education programs were developed, and such training was increasingly made available to young people. Early evaluations were promising, and it appeared that such preparation was associated with subsequent low rates of crashes and violations. As a result, in many States driver education was made mandatory for early licensure. However, once those taking driver education were no longer a select group, the apparent beneficial effects of the program disappeared. The high crash and injury rates experienced by young drivers persisted. In fact, it is not until around age 25 that driver performance appears to plateau, and mileage crash rates remain relatively low until they again increase with the infirmities accompanying old age. The important point is that it takes years to become a reasonably proficient driver.

There is no way that driver education as traditionally conducted can hope to have a meaningful impact on the driving performance of young beginning drivers. While it is readily conceded by driver education instructors that the current version of driver education, namely 30 hours of classroom instruction and six hours behind the wheel, is far from adequate, it is also apparent that society cannot afford to extend this training significantly. Therefore, there is a need to identify alternative approaches.

This paper presents a scheme for developing a driver education program that is based on scientific analysis and coordinating it with a graduated licensing system.

HUMAN FACTORS ANALYSIS OF DRIVING BEHAVIOR

Driving is probably the only complex task engaged in by so many people that has been subjected to so little scientific analysis. In the military, pilot training has been subjected to careful scrutiny and analysis to identify how best to train novice pilots. In industry, we have conducted numerous human factors analyses to increase efficiency and safety of performance. In the realm of sports, videotapes of performance are subjected to computer analyses, and athletes are wired to sophisticated equipment so that we can gain a better understanding of how to improve performance. Even race horse performance has been carefully analyzed using the latest scientific technology. Yet similar expertise has not been brought to bear on the task of driving. While we know that experienced drivers differ from inexperienced drivers, we still do not understand the dimensions that separate the two kinds of performance.

Figure 1 outlines the steps in a human factors analysis of driving behavior and the integration of a comprehensive driver education program with a graduated licensing program. A more detailed description of this approach appears elsewhere (Waller, 1983).

Identification of Human Performance Parameters Relevant to Driving

A first major task is to identify those human performance parameters that are relevant to driving. This may be accomplished by a survey of the human factors literature and the participation of and review by human factors and driving specialists. Once relevant behaviors have been identified, they must be judged in terms of the feasibility of using them in a driver training program. However, the identification of relevant behaviors is only a beginning.

Empirical Determination of Novice-Experienced Driver Differences

The next step is to test the identified parameters empirically to determine which ones actually differentiate between novice and experienced drivers. Those that can be empirically demonstrated to separate the two driver groups must then be examined to determine whether and how they may be amenable to training. For example, it has been shown that experienced drivers use their eyes very differently than inexperienced drivers, scanning the roads ahead, while novice drivers sequentially fixate on specific objects, such as a road sign, the curb, or the hood of the car (Bhise and Rockwell, 1971; Mourant and Rockwell, 1971; Rockwell, 1971; Zell, 1969).

**Identification of human performance
parameters relevant to driving**

**Empirical determination of
novice-experience differences**

**Determination of amenability
to training of identified factors**

**Development of training procedures
(computerized interactive games)**

**Coordination with behind-the-wheel training
and with televised material covering
classroom portion of driver education**

**Integration with parent involvement
graduated licensing program**

FIGURE 1
Proposed Program for Driver Education and Training of Young Drivers

It has also been shown that young drivers do not perceive as high a level of risk as older drivers viewing the same situation (Finn and Bragg, 1986), that young drivers are more likely to overrate their driving ability than older drivers (Matthews and Moran, 1986), and that younger drivers are less likely than older drivers to detect children in traffic situations and consequently behave more dangerously (Egberink, Lourens, and van der Molen, 1986).

Determination of Amenability to Training of Identified Factors

The question is whether and how the novice driver can be trained to use his eyes the way the experienced driver does, to detect more realistic levels of risk, to judge their own driving ability more realistically, and to detect children in a traffic situation as readily as the experienced driver. Obviously, this is what occurs with years of driving experiences, but the goal is to speed up the process and conduct it under less hazardous conditions.

DEVELOPMENT OF A COMPREHENSIVE DRIVER EDUCATION PROGRAM

Development of Training of Identified Skills

Those behaviors identified as amenable to training should then be incorporated into training procedures, possibly involving computerized interactive tasks or games. These may be practiced to a performance criterion at the subject's convenience. However, the young person must achieve a specified level of performance on all identified parameters before licensure may occur. It should be noted that the behaviors of interest must not be limited to what is ordinarily defined as skill but rather must include tasks requiring the processing and interpretation of information from several sources with appropriate judgment and performance resulting.

Coordination with Behind-the-Wheel Training

The development of proficiency in the various human performance parameters may be coordinated with behind-the-wheel instruction in the control and operation of a vehicle. If the relevant human performance parameters have been identified, there should be some generalization from the practice of the specific skills to the integrated driving task.

Televised Preparation of Classroom Material

The standard driver education course includes 30 hours of classroom instruction. It is likely that most of the information included in this portion of driver education could more effectively be presented in well programmed television. This approach would mean that considerable resources could be devoted to the development of the basic information, with provision for regular updating from year-to-year. In 20 hours of well designed televised material it should be possible to do a much more effective job of covering the material now presented in driver education classes. There would still be time for discussion and for students to question the instructor about any ambiguous areas. In addition, the six hours behind-the-wheel instruction would still be used to assist the student in acquiring the very basic beginning skills of vehicle control.

INTEGRATION OF TRAINING WITH GRADUATED LICENSING PROGRAM

At this point the student should have mastered specified levels of skill on the identified human performance parameters, completed the material presented in the classroom portion of driver education, and acquired initial skill in controlling a vehicle. However, the student is still far from possessing minimally acceptable driving skills. Nevertheless, the student should be ready for the first step in a graduated driver licensing program. (An early version of the proposed approach appeared in Waller and Reinfurt, 1973.)

Daytime Driving With Parent

The first step should occur after successful completion of vision and knowledge driver license examinations and should allow daytime driving only, with a parent, guardian, or other responsible adult specified by the licensing agency present in the right front seat. Presumably the very first driving experience would occur under circumstances of relatively low traffic volume and freedom from other excessive demands on the novice driver's skill. The first level of licensure, as well as those following, is shown in Figure 2.

Daytime and Nighttime Driving With Parent

After an extended period of time, the young driver could be allowed to drive at night, still with the responsible adult present. Again there would be an extended period of time during which such practice could occur.

Daytime Solo Driving. Nighttime With Parent

At this point the driver should be ready to undertake solo driving under daylight conditions. Before solo driving occurs, however, there should be careful evaluation of driving skill at the licensing station to insure that the driver has indeed mastered a minimal level of competence. Solo nighttime driving would still not be allowed.

Daytime and Nighttime Solo Driving

After another extended period of time during which the driver may drive alone during the day but only with the responsible adult at night, the young driver should again be tested by the license examiner under nighttime conditions before being authorized to drive alone at night.

PARENT PARTICIPATION

Parents (or other specified responsible adults) would be involved in two major ways. First, they would provide monitoring and supervision of the young driver during the greatest part of initial skill acquisition. The parent may be assisted by the provision of a list of maneuvers and driving tasks that are of particular importance. This listing could include ratings for each young driver, and identifying those areas in special need of practice.

		Driver Age							
		14	15	16	17	18	19 - 20	21 - 25	
Day	Time	Restriction	0.00 BAC	0.00 BAC	0.00 BAC	0.00 BAC	0.00 BAC	0.00 BAC	
		Parent required							
		No parent required ≤ 1 passenger			0.00 BAC	0.00 BAC	0.00 BAC	0.00 BAC	≤ 0.05 BAC
Night									
		Parent required		0.00 BAC	0.00 BAC	0.00 BAC	0.00 BAC	0.00 BAC	
		No parent required ≤ 1 passenger				0.00 BAC			

FIGURE 2
Proposed Graduated License System

The second major role of the parent is that of assuming official responsibility for the young driver and certifying that the youth has completed a specified amount of driving under parental monitoring before moving to the next stage of licensure, e.g., 1000 miles daytime driving and 500 miles nighttime driving before nighttime solo driving may occur. This approach would have two major effects. First, it would discourage applicants from simply moving to each successive stage of licensing without reasonable driving practice in the interim. Second, it would impress upon the parent the importance of his or her role in assisting the young driver, i.e., it would require a level of commitment from the parent that would likely lead to increased supervised practice.

It may be argued that the parent is not trained to teach young drivers how to drive, and that is true. However, it is probable that the major influence of the parent is not so much related to driving instruction as it is to psychological effect. The young driver is simply not going to try certain things in the presence of the parent that may be tried either alone or with other teenagers. Hence, the role of the parent is not so much one of teacher as of monitor.

It may also be argued that the parent may certify that the young driver has accumulated a certain amount of practice when in fact it is not true. It would not be feasible to police such actions. However, it is likely that most parents would not grossly distort the facts, and that overall young drivers would receive much more supervised practice than is now the case.

DRIVER LICENSING EXAMINATIONS

The program would entail several examinations at the driver license station. The first, occurring at the initiation of the graduated license program, would include only vision and knowledge testing. The second, possibly as much as two years later, would precede daytime solo driving and would include vision and a behind-the-wheel test in daylight. The third, occurring prior to nighttime solo driving, would include vision testing, preferably under conditions of reduced illumination and including glare recovery, and a behind-the-wheel test at night, possibly requiring more complex maneuvers as well. Table 1 lists these levels of license examination, along with suggested ages at which they may occur.

It may seem excessive to include vision testing at each licensing stage, but young drivers actually have poorer vision than drivers in their thirties. The lower curves in Figure 3 illustrate the proportion of license applicants passing the driver license vision test without corrective lenses (Waller, Gilbert, and Li, 1980). It can be seen that a lower proportion of applicants in their twenties can pass the test without corrective lenses than is true for drivers in their thirties and even early forties. The adolescent years are often accompanied by rapid vision changes, and the driver license program offers an opportunity to detect any such problems at this age.

ADDITIONAL PROGRAM DIMENSIONS

Two other dimensions would be superimposed on this graduated system, namely, restrictions on alcohol use and restrictions on passengers.

Alcohol Restrictions

Alcohol would be prohibited entirely during the early stage of driving skill acquisition. (This is not saying that young people would not be allowed to drink at all. It is only saying that they would not be allowed to drive with any detectable alcohol in them.) Until age 21 a blood alcohol concentration (BAC) of 0.00 percent would be required, and from age 21 through age 24 the maximum legal BAC should be no more than 0.05 percent.

It has been shown that raising the drinking age to 21 is associated with a significant decrease in nighttime fatal crashes involving young drivers affected by the law (DuMouchel, Williams, and Zador, 1985). Furthermore, differential alcohol levels for young drivers have been shown to be effective in reducing the alcohol crash involvement of those drivers coming under the law (Lacey, et al., in preparation, see Figure 4). Although the system proposed here does not specify an age for purchase of alcohol, it does specify strict limits for young drivers operating a vehicle. There is sufficient evidence that young drivers have the highest rates of alcohol-related fatal crashes based on mileage driven and that teenagers are more likely to be impaired and involved in crashes at lower levels of alcohol (Fell, 1982). It has been hypothesized that the difficulty stems from a combination of inexperience with driving and inexperience with drinking. In any event, there are empirical grounds for limiting alcohol involvement by young people when they are driving.

Passenger Restrictions

Finally, consideration should be given to restricting young beginning drivers regarding passengers. Data from Australia (Johnston, 1986) indicate that the presence of one passenger or no passengers is associated with lower crash risk than that associated with more than one passenger. Although data are not presently available, it may be that the young driver with more than one passenger is in a car loaded with other teenagers, creating an extremely complex social situation. It is also probable that such situations occur more often at night when the driving task itself is more difficult. Although there is a need for more research in this area, there is evidence that fatally injured teenager passengers are most likely to be in vehicle driven by teenage drivers and that half of teenage passenger deaths occur at night (Williams and Karpf, 1983). One proposed countermeasure is to restrict the transport of teenage passengers by teenage drivers.

TABLE 1
Levels of License Examination
Driver Licensing Examinations

1. Vision, Knowledge - Age 14
2. Vision, Performance I - Age 16
3. Vision, Performance II - Age 17

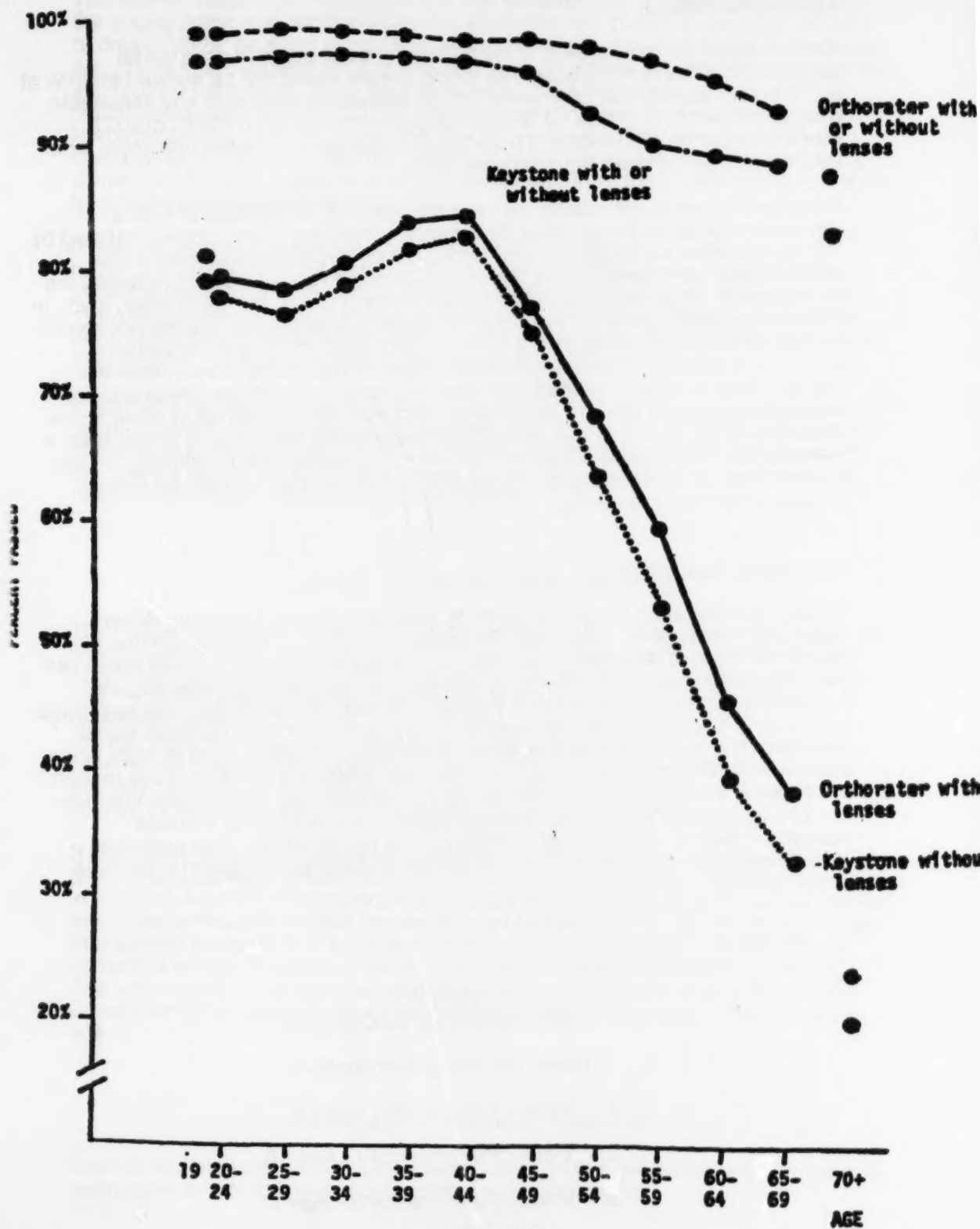


FIGURE 3
Passing rates on vision testing equipment by age

PROVISIONAL STATUS OF LICENSE FOR YOUNG DRIVERS

The young driver's license should be provisional, that is, the driver should be required to earn graduation from one level to the next. There could be a system of disincentives whereby convictions for traffic violations postpone graduation to the next level of licensure and/or impose more severe restrictions and/or result in license suspension or other sanctions. This latter approach is similar to that implemented in California (Hagge and Marsh, 1986) and to some extent to some of the provisions in the program tested in Maryland (McKnight, Hyle, and Albrecht, 1983).

The provisional status of the license should serve as an incentive to drive carefully and lawfully so that graduation to the next level may occur on schedule. However, the proposed system does not rely solely on such threats of restriction. Rather, it combines the support and training necessary to acquire initial driving skill under relatively safe conditions and allows gradual movement from one level of driving complexity to the next. Because it may be initiated earlier than the current age of licensure, it offers the possibility of extensive supervised practice at minimal cost to the taxpayer.

AGE OF LICENSURE

Because of high crash rates of young drivers, it has been argued that driver licensure should not occur until at least age 18 (Robertson and Zador, 1977; Robertson, 1981). The system proposed here is not tied to any specific age level. However, it is usually much more difficult to take something away from people than it is to extend existing privileges. The major rationale underlying the proposed program is that young beginning drivers should not be allowed to drive on their own until they have had extensive practice under supervision. Young people want to get their license, and parents are usually eager to give up chauffeuring them. Therefore, consideration should be given to lowering the age at which driver education begins.

The proposal does not recommend lowering the age at which young drivers begin driving on their own. Rather it is an attempt to insure that when they do start driving on their own, whether it is at the current age of licensure or later, they have already acquired considerable supervised practice and should, therefore, have progressed further through the learning curve for driving. This does not mean that they will not have crashes or that they will not take risks. However, it should have a major impact on the rate at which these incidents occur.

Ideally a graduated licensing system would apply to all beginning drivers, no matter what their age. In actual practice such an approach is probably not politically feasible. However, because in many industrialized societies beginning drivers are predominantly young people, the proposed system could have a significant impact on the total population of beginning drivers.

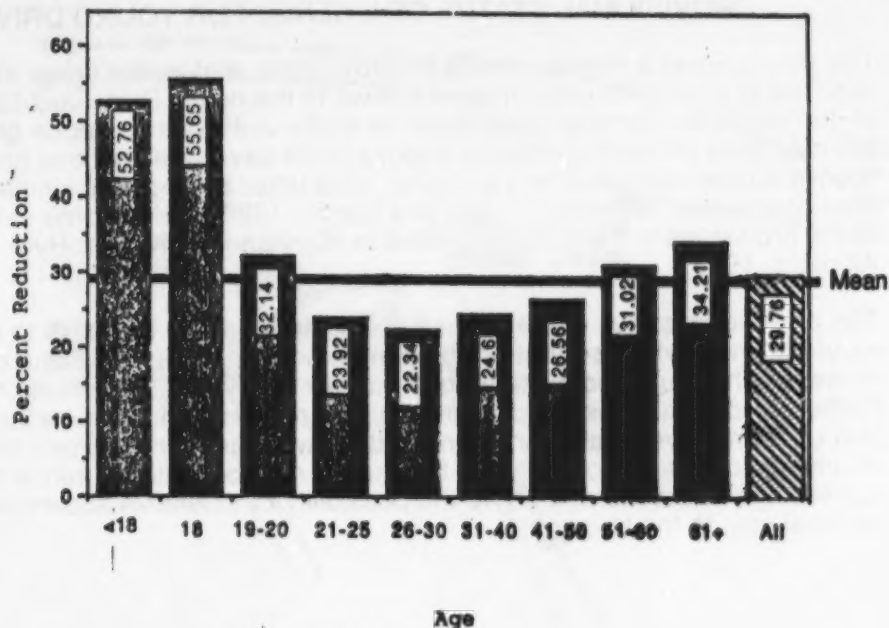


FIGURE 4
Reduction in the Proportion of A/R Crashes by Age
Comparing 1982 with 1985

SUMMARY

In summary, this proposal recommends, first, that there should be a comprehensive human factors analysis of the driving task that is used as the basis for developing procedures for practicing driving-related tasks to a specified level of proficiency. It further recommends that driver education material taught in the classroom be incorporated into well developed television programming. This material should be widely available to students and their families, as well as to any other interested parties. The practice on the driving-related behaviors and the televised instruction should be coordinated with behind-the-wheel instruction to provide rudimentary skill in vehicle operation.

However, it is not necessary to wait for the human factors analysis or the development of a televised version of the classroom materials. States could immediately implement a graduated licensing system coordinated with driver education. Upon successful completion of an approved driver education course, a young person could enter the first level of the graduated licensing program. The first two levels require parental supervision of all driving, so that it may be feasible to make these levels available prior to the current legal age of licensure. In this way, neither parents nor youngsters would be sacrificing privileges. It would simply mean that the parent who presently chauffeurs a child would move over and allow the young person to do the driving. Ideally the proposed system would insure that when we first license young people and allow them to drive solo, we would have provided extensive behind-the-wheel practice at minimal cost to the taxpayer.

The components and steps proposed for the graduated licensing program are based on the best evidence available. First of all, it is clear that the acquisition of driving skill occurs over several years and the error rate, as measured by crashes, is highest at the initial stages and gradually decreases. Hence, there is a basis for limiting initial driving to less hazardous circumstances.

Next, the proposal that initial skill acquisition be allowed to occur at an earlier age than is presently the case is consistent with evidence that complex psychomotor skills are best mastered if learning occurs early. For example, tennis instruction that begins at age 18 is not likely to produce outstanding performance. Most aspiring concert pianists would not begin instruction in their late teens. It is recognized that young teenagers do not have judgment of older drivers, but all initial practice would occur with a responsible adult present, usually the parent. The data on fatal crash involvement of young people suggest that when passengers are present, they are usually other young people.

Extensive daytime driving would precede nighttime driving, and the latter has been shown to be more hazardous, particularly for teenage drivers (Williams, 1985). This stage would be similar to the licensing programs in those States with curfew laws. It has been found that the more stringent the curfew law, the more impact it has on young driver crashes (Insurance Institute for Highway Safety, 1984). There is also evidence that most young drivers comply with nighttime restrictions most of the time (Insurance Institute for Highway Safety, 1986).

The support for restricted alcohol use by young drivers comes from studies of the impact of increasing the drinking age and an evaluation of the impact of a law restricting drivers under 18 years of age to zero BAC. The studies show these measures result in a reduction in alcohol related crashes involving the young drivers affected by the law.

The evidence for passengers restrictions is more limited. Nevertheless, data from Australia and evidence on teenage passenger deaths suggest that there is a basis for concern regarding multiple passengers, and particularly teenage passengers at night.

Finally, the requirement that young drivers maintain clean records in order to move to the next level of licensure is based in part on the evaluation of the California provisional license program in which drivers face greater restrictions in the event of more than one traffic conviction and/or accident in 12 months (Hagge and Marsh, 1986).

The Federal Government of Australia is developing a graduated license system that will be offered to the Australian States (Boughton, 1986). In the course of developing the program, Boughton conducted surveys of government officials and the public regarding their receptivity to such a program. She found that parents, youngsters, and politicians were positive about such an approach, but bureaucrats were less than enthusiastic.

It should be emphasized that the implementation of a program such as the one outlined here should be accompanied by a careful evaluation, preferably one that could differentiate among the various components of the program so as to determine empirically which measures are most cost effective in reducing motor vehicle injury morbidity and mortality among our youth.

REFERENCES

- Bhise, VD and Rockwell, TH. Role in peripheral vision and time sharing in driving, Proceedings of Fifteenth Conference of the American Association for Automotive Medicine, Colorado, 1971, 320-341.
- Boughton, CJ. Development of graduated licensing in Australia, presented at International Symposium on Young Drivers' Alcohol and Drug Impairment, Amsterdam, The Netherlands, September, 1986.
- Dumouchel, W., Williams, AF, and Zador, P. Raising the Alcohol Purchase Age: Its Effects on Fatal Motor Vehicle Crashes in 26 States. Washington, DC: Insurance Institute for Highway Safety, 1985.
- Egberink, HO, Lourens, PF, and van der Molen, HH. Driving strategies among younger and older drivers when encountering children, Accident Analysis and Prevention. 18, 315-324, 1986.
- Fell JC. Alcohol Involvement in Traffic Accidents: Recent Estimates from the National Center for Statistics and Analysis. Washington, DC: National Highway Traffic Safety Administration, 1982.
- Finn, P. and Bragg, BWE. Perception of the risk of an accident by young and older drivers, Accident Analysis and Prevention. 18, 289-298, 1986.
- Hagge, RA and Marsh, WC. An Evaluation of the Traffic Safety Impact of Provisional Licensing. Sacramento, CA: California Department of Motor Vehicles, 1986.
- Hartunian, NS, Smart, CN, and Thompson, MS. The Incidence and Economic Costs of Major Health Impairments: A Comparative Analysis of Cancer, Motor Vehicle Injuries, Coronary Heart Disease, and Stroke. Lexington MA: Lexington Books, 1981.
- Insurance Institute for Highway Safety. Status Report, Vol. 19, No. 10, June 9, 1984.
- Insurance Institute for Highway Safety. Status Report, Vol. 21, No. 3, March 22, 1986.
- Johnston, I. The integration and interdependence of countermeasures, presented at the International Symposium on Young Drivers' Alcohol and Drug Impairment, Amsterdam, The Netherlands, September, 1986.

- Jonah, BA. Accident risk and risk-taking behavior among young drivers, Accident Analysis and Prevention. 18, 255-271, 1986.
- Lacey, JH, Stewart, JR, Popkin, CL, Rudisill, LC, Rodgman, EA, and Geissinger, SB. Evaluation of the North Carolina Safe Roads Act, Chapel Hill, NC: UNC Highway Safety Research Center, in preparation.
- Matthews, ML and Moran, AR. Age differences in male drivers' perception of accident risk: The role of perceived driving ability, Accident Analysis and Prevention. 18, 199-313, 1986.
- McKnight, AJ, Hyle, P. and Albrecht, L. Youth License Control Demonstration Project. Washington, DC: National Highway Traffic Safety Administration, 1983.
- Mourant, RR and Rockwell, TH. Visual scan patterns of novice and experienced drivers. Paper presented at Symposium on Psychological Aspects of Driver Behavior, The Netherlands, 1971.
- National Research Council. Injury in America: A Continuing Public Health Problem. Washington, DC: National Academy Press. 1985.
- Robertson, LS. Patterns of teenaged driver improvement in fatal motor vehicle crashes: Implications for Policy Choice, Journal of Health Politics, Policy and Law, 6, 303-314, 1981.
- Robertson, LS and Zador, PL. Driver Education and Fatal Crash Involvement of Teenaged Drivers. Washington, DC: Insurance Institute for Highway Safety, 1977.
- Rockwell, TH. Skills, judgment and information acquisition in driving. In T.W. Forbes (Ed.) Human Factors in Highway Traffic Safety Research. New York: Wiley-Interscience, 1972.
- U.S. Department of Health Education, and Welfare. Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention. Washington, DC: U.S. Government Printing Office, 1979.
- Waller, PF. Young Drivers: Reckless or Unprepared? in Proceedings of International Symposium on Young Driver Accidents, Traffic Injury Research Foundation of Canada, 1983.

Waller, PF, Gilbert, EF, and LI, LK. An Evaluation of the Keystone Vision Tester. Chapel Hill, NC: UNC Highway Safety Research Center, 1980.

Waller, PF and Reinfurt, DW. The Who and When of Accident Risk: Can Driver License Programs Provide Countermeasures? Chapel Hill, NC: UNC Highway Safety Research Center, 1973.

Williams, AF. Nighttime driving and fatal crash involvement of teenagers, Accident Analysis and Prevention. 17, 1-5, 1985.

Williams, AF and Karpf, RS. Deaths of teenagers as passengers in motor vehicles, Accident Analysis and Prevention. 15, 49-54, 1983.

Zell, JF. Visual Search in Driving as a Function of Experience. Unpublished Masters Thesis, Ohio State University, 1969.

**SUMMARY OF PRELIMINARY RESULTS FOLLOW-UP EVALUATION
SAFE PERFORMANCE CURRICULUM DRIVER EDUCATION PROJECT**

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**Prepared for
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Spokane, Washington
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Introduction

The Safe Performance Curriculum Driver Education Demonstration Project was initiated by the National Highway Traffic Safety Administration (NHTSA) with the DeKalb County School System, Georgia in September 1976. The primary objective of the Project was to determine the crash reduction potential of competency-based driver education training as compared to no formal training. Besides a number of interim reports done throughout the Project, a final report was completed in June 1983.

A summary of results from the 1983 final report is:

Administrative Results

Over 16,000 students volunteered for the Project and were randomly assigned to one of three study groups - Control, Pre-Driver Licensing (PDL), and Safe Performance Curriculum (SPC).

The SPC program (about 80 hours) included instruction on basic control, normal driving, environmental factors, perceptual skills, driver impairments, emergency situations, non-operational activities and personal readiness, and was presented through classroom, simulation, range and on-street training.

The PDL program (about 30 hours) only included instruction on basic control and normal driving but training also was presented through classroom, simulation, range and on-street training.

Control students received no formal driver education through the school system.

The training of PDL and SPC students for the evaluation was begun in 1978 and completed in 1981.

Impact Results

Three levels of analysis were performed; at the "assignment" level which included all students whether they had a driving record or not, at the "assignment and licensed" level for only those assigned students who had a driving record, and at the "training and completed" level which included only those assigned students who completed the training and had a driving record.

Analysis at the two "assignment levels" was to determine the impact of implementing a driver education program. Analysis at the "training level" was to determine the effectiveness of the SPC and PDL training.

Analysis at the "assignment" level showed no significant differences between the three groups in mean number of crashes or convictions through the first two years of driving.

For those students who were licensed and for those students who were licensed and completed either training course, there was a significant reduction in crashes during the first six months of driving, but the effect was not significant by the end of the first year of driving.

For those students who were licensed and for those students who were licensed and completed either training course, there was a significant reduction in convictions during the first 12 months of driving, but the effect was not significant by the end of 18 months of driving.

The number of students who were trained and who had at least two years of driving experiences at the time the evaluation was performed for the Final Report was only 50% of those who were assigned. Because of the small number of students who had extended driving experience, the NHTSA decided to continue to monitor the driving records of the students until such time as the majority would have at least four years of experience. By the middle of 1986 the majority of students had this experience and efforts were initiated to reevaluate the project. The following is a summary of this effort and the preliminary results of the follow-up evaluation.

Follow-up Evaluation

Background

The data base used for the follow-up analyses was compiled during January-March 1987 from data tapes and information provided to NHTSA by Battelle Laboratories, the original evaluation contractor for the project.

Students' driving records were obtained by Battelle from the State of Georgia in May 1986 and include driving histories of the project students through 1985.

Two levels of analysis were performed; at the "assignment" level and at the "training" level. The analyses at both levels included only those students who had driving records.

Analysis at the "assignment level" was to determine the impact of implementing a driver education program. It includes all students who were assigned to one of the three programs - Control, SPC, or PDL.

Analysis at the "training level" was to determine the effectiveness of the SPC and PDL training. It includes all the control students but only those SPC and PDL students who had received at least some training.

To control for exposure, analyses were done for specific exposure intervals. Six intervals were used, the first year of driving experience through the first six years of driving experience. Students were included in a particular analysis only if they had accumulated the appropriate driving exposure.

To control for the differences in group sizes between the three study groups for the exposure periods, group averages (means) and group ratios (incidents per 1000 students) were used for the comparison analyses.

The group averages were used to assess the effectiveness of the training to reduce overall crashes and convictions. The group ratios were used to assess the effectiveness of the training to prevent students from having a crash or conviction.

For the one year analysis, about 93% of the "assignment" students had accumulated a year of driving experience, while fewer than 80% of the "training" students had this experience. This means that about 7% of the students never got their driver license and about 13% of those students who were assigned to training never showed up for training.

The number of students who had four years of driving experience is only slightly less than those who had one year (87% at the "assignment" level and 73% at the "training" level).

However, the number of students who had more than four years driving experience is much smaller, resulting in only about 40% of the "training" level students and 50% of the "assignment" level students having appropriate experience for the six year analysis.

Because of the small number of students who had accumulated more than four years of driving experience, the results of the five and six year analyses must be viewed with caution.

Crash Reduction Findings

There are NO significant reductions for SPC students in the number of crashes or the number of students who had a crash as compared to control students.

There is a small (around 5%) but significant reduction in the number of crashes for PDL "assignment" and "training" students as compared to controls. The reduction is fairly consistent for the first year through the first six years of driving experience.

The PDL also was effective in reducing the number of students who had a crash, a significant reduction for the first two years, a marginal reduction thereafter.

Conviction Reduction Findings

Both the "assignment" and "training" level PDL and SPC students had significantly fewer total convictions during their first six years of driving than did controls (average of 10% for PDL and 9% for SPC).

This significant reduction in convictions was for males only.

A significantly fewer number of PDL students (6%) had at least one conviction through their first six years of driving than did control students. The reduction in the number of SPC students having at least one conviction was significant, but only through the first three years of driving for the "training" students.

Other Findings

Overall, for those students who had a crash, the largest percent had the crash in the first year of driving (about 20%). By the end of six years, 60% of the male and 46% of the female students had a reported crash.

Overall, about 27% of the students had at least one conviction in their first year of driving. During the first six years of driving, males averaged 2.6 times as many convictions as did females. After six years of driving, 81% of the male and 56% of the female students had at least one conviction.

Summary of Findings

The preliminary results of the follow-up analyses indicate the following:

- There are significant reductions for PDL students in the number of crashes (around 5%) and in the number of students who had a crash (around 5%) through six years of driving experience.
- There are **NO** significant reductions in the number of crashes or students who had a crash for SPC trained students.
- Both the PDL and SPC students had significantly fewer convictions (10% and 9%) than did controls.
- Overall, males had 1.6 times as many crashes and 2.6 times as many convictions as did females.
- The PDL was effective in reducing convictions and crashes for males and crashes for females.
- The SPC was effective in reducing convictions but not crashes for males and neither crashes nor convictions for females.

Issues

The analyses and results to date have raised many questions, such as why the short course appears to be effective while the long course is not. These questions must be explored through additional analyses of the current data set before any conclusions are final. In addition, a number of studies from the earlier evaluation (such as the assessment of the training course's effect on driving test performance) should be repeated. The results of these studies could change using the more complete driving record data.

Also, the present findings are limited by the available driving record data. The requirement for 16,000 students to be a part of the project was based on the projected number of students who would obtain a license, be trained, be involved in a crash during their first two years of driving, and that the training would reduce these crashes by 10 percent. The more extensive driving record information now in the data set still will not allow for reliably detecting any training effects smaller than about 5 percent.

The NHTSA will perform additional analyses to better understand these preliminary results and their implications. Until these additional analyses can be performed, no final conclusions can be drawn.

**RESEARCH AND DEVELOPMENT REPORTS
IN SUPPORT OF
PROVISIONAL DRIVER LICENSING PROGRAMS**

INTRODUCTION

Selected abstracts from National Highway Traffic Safety Administration (NHTSA) driver licensing research, development and operational evaluation reports, and selected non-Federal Government reports are presented. The abstracts represent a historical review of efforts to improve the driver licensing and control activities of the states.

This document is not intended to contain all material relevant to improved state driver licensing programs addressing the young driver problem. Much of the material herein has been selected because it is representative of similar studies, it reflects the most current state-of-the-art, and/or it is considered to be a major contribution in the field.

1. Ronald Coppin, Gareth Ferdun, and Raymond Peck, The Teenaged driver: an Evaluation of Age, Experience, Driving Exposure and Driver Training as They Relate to Driving Record, California Department of Motor Vehicles, Sacramento, California 95813, February, 1965.

Abstract: Major findings from the driving records of 10,250 teenagers are:

Exposure was more important than age in determining accident and violation rates, except for older males who had fewer accidents than younger males.

More experienced drivers, both male and female, had more violations.

No significant differences were found between groups completing behind-the-wheel driving training and groups who did not. Evidence to support raising the minimum licensing age in California was not found in terms of absolute risk. Relative risk pointed to the younger male's predisposition to crashes.

2. Harrington, David M. and McBride, Robin S., "Traffic Violations by Type, Age, and Marital Status," Accident Analysis and Prevention, May, 1970.

Abstract: Study of the records of California drivers showed that the mileage-adjusted rate of speed, equipment, and major violations decreases with increasing age. Sign, turning passing, and right of way violations have a U-shaped relationship with age. Males have a higher rate than females for speed, equipment, passing, and major violations, and a lower rate for sign and right of way violations, with little differences for turning violations. Single persons average a greater number of each type of violation than married persons. Similar age and sex differences were found for violations associated with fatal and injury accidents.

3. Henderson, Michael and Messiter, Gordon, The Provisional License Scheme. A Statistical Evaluation, Department of Motor Transport, New South Wales, New Zealand, September, 1970. (DOT HS-013 750)

Abstract: In New South Wales, drivers in their first year of licensed experience may have their licenses cancelled forthwith (usually for three months) for any one of a wide variety of moving traffic offenses. They are subject to a 40 m.p.h. speed limit, and must carry an identifying "P" plate. These measures were brought into effect in January, 1966, and are jointly known as the "provisional license scheme." An analysis of the effectiveness of the scheme has been attempted in terms of determining any reduction in the accident rate of first-year drivers. A small but statistically significant reduction was found; however, there is reason to doubt the validity of the data.

4. Waller, Patricia F., "The Youthful Driver: Some Characteristics and Comparisons," Behavioral Research and Highway Safety, Volume 1, Number 3, Fall, 1970.

Abstract: The author proposes to begin the behind-the-wheel driving experience under driver education teacher and parent supervision, followed by restricted licensing, supervised at night by the parent, before full licensure. Such a program might begin for applicants at age 14.

5. Harrington, David M., The Young Driver Follow-up Study, California Department of Motor Vehicles, Sacramento, California 95813, 1971. (DOT HS-011 362)

Abstract: A sample of 13,915 drivers licensed at ages 16 and 17 was studied. Data studied included driving record, biographical information, crash and conviction records, high school records, questionnaires, and interviews. The average number of crashes showed little change in the first four years of driving. This result does not provide support for increasing the licensing age to 18. The crash rate adjusted for mileage decreased with increasing experience. License suspension and revocation were ineffective in keeping drivers off the road. Citizenship grade in high school was the best predictor of crashes and convictions, but biographical data could not be used to identify accident prone drivers prior to licensing. Those with behind-the-wheel driver training had better driving records, but also they had more socially desirable personalities, indicating bias. High accident subjects were more reckless, emotional, involved with cars, and characterized by social deviancy.

6. National Transportation Safety Board, Special Study: Youth and Traffic Safety Education, National Transportation Safety Board, Washington D.C. 20594, July 1971. (DOT HS-011 032)

Abstract: The state of knowledge is reviewed and possible reasons for the high death rate discussed. The high involvement with alcohol is shown. The presently unknown safety value of current programs of instruction is noted. The need for instruction of youth, adult supervision and monitoring of novice drivers for extended periods after licensing is discussed. The central role of the driver licensing function is examined as is the potential role of driver improvement programs. The relevant activities of NHTSA are reviewed and the need for integrated efforts focused on young driver emphasized.

Seven recommendations are directed to NHTSA, focusing on (a) a diagnostic approach to driver preparation, to driver licensing, and driver improvement programs; (b) efforts in the Alcohol Safety Education Programs; (c) possible approaches to evaluation of driver education programs; (d) extension and improvement of current examinations for licensing; and (e) integration of efforts of State agencies. An eighth recommendation is made to the NHTSA Youths United Toward Highway Safety (YOUTHs) and asks the group to find ways to develop an individual's appreciation of highway losses as the major threat to survival into adulthood. An extensive bibliography is included.

7. Pelz, Donald C. and Stanley Schuman, Motivational Factors in Crashes and Violations of Young Drivers, Highway Safety Research Institute, University of Michigan, Ann Arbor, Michigan 48109, October, 1971.

Abstract: With a probability sample of 3,000 drivers, it was previously reported that crashes and violations-plus warnings for young men rose to a maximum at age 18 or 19 and then declined. Among several dozen indexes constructed from interview data, similar curvilinear patterns in relation to age of young men were found for such factors as getting engaged or breaking an engagement, changing jobs, driving confidence such as rejection of seat belts, use of driving to blow off steam after arguments, and time involvement with cars. Many of these measures also related to occurrence of crashes and especially violations. Other measures such as hostility indexes showed a decrease with age, while drinking and smoking steadily increased, and each of these also related to driving record.

8. Carlson, William L., "Alcohol Usage of the Nighttime Driver," Journal of Safety Research, March, 1972.

Abstract: Alcohol usage in the general night driving population is compared with use in the population of persons involved in single-vehicle night crashes. Randomly selected drivers were given a breath test of alcohol and a short interview. Heavy alcohol usage was observed in the early morning driving population as well as a corresponding increase in alcohol-related crashes. Persons inexperienced in drinking and driving (young drivers and women) were found to be involved in crashes at lower blood alcohol concentrations. The study was conducted in Washtenaw County, Michigan. A study done in Mecklenburg County, North Carolina is also discussed briefly.

9. Forbes, T.W.; Nolan, R.O.; Schmidt, F.L. and Vanosdall, F.E.; "Driver Performance Measurement Based on Dynamic Driver Behavior Patterns in Rural, Urban, Suburban and Freeway Traffic," Accident Analysis and Prevention, Vol. 7, December 1975. (DOT HS-018 010)

Abstract: A method of driver performance measuring was developed. For evaluation purposes, two new groups of observers were trained by a team of experts. Statistical analysis of results showed that their ratings were very reliable. This procedure is applicable to research when conventional accident records cannot be validly used, such as for comparing small groups to improve driver education or driver license examining methods.

10. McGuire, John P., State Driver Improvement Analysis, Volume I. Summary, Volume II. Technical Report, Volume III Appendices, Public Systems Incorporated, Sunnyvale, California, National Highway Traffic Safety Administration, Washington, DC, 20590, March 1976. (DOT HS-801 841/842/843)

Abstract: A comprehensive review of the literature pertaining to driver improvement effectiveness and of a prior state-of-the-art review by Kaestner and Goldstein is presented. Data on the status of driver improvement nationally and in the various states is presented. The desirable attributes of a driver improvement program are presented in terms of a model driver improvement system. Based on the model and the results of the surveys, specific recommendations for each state are presented along with a schedule for implementation.

11. Reaser, Joel M.; McBride, Robin S.; Rosen, Theodore; and Rimm, Myron; The Development and Testing of Parent Involvement in Driver Education, National Highway Traffic Safety Administration, Washington, DC, 20590, November, 1976. (DOT HS-802 079)

Abstract: A driver education project (PAIRED Program) which integrated professional in-class instruction with parent-supervised on-road driving practice was performed. The program was designed at two levels--model program (full parent participation including meetings with driver education instructors) and materials-only program. Due to the limited response from parents in the urban schools, the model program was implemented only in a suburban school, while this materials only program was implemented in both a suburban and two urban schools. Instructors and parents regarded the instructional materials as very useful and easy to understand. While the study did not provide conclusive results regarding the viability and effectiveness of parent participation driver education programs, there was reason to believe that the PAIRED Program may be a cost-effective and performance-effective program if parent recruiting and other implementation problems were better handled (for example, administered as a part of the State's driver licensing program).

12. Seaver, W.B.; Nichols, J.L.; Carlson, W.L.; and Voas, R.B.; An Analysis of the Impact of Driver Education on the Licensing of 16 and 17 Year Olds, National Highway Traffic Safety Administration, National Highway Traffic Safety Administration, Washington, DC, 20590, August 1979. (DOT HS-804 850)

Abstract: A study was done to explore the hypothesis that driver education increases the number of teenagers licensed to drive before age 18. Multiple regression analyses were used to estimate the strength of the relationship between driver education enrollment, the presence of laws requiring driver education for licensing before age 18, and the rate of licensing of 16 and 17 year olds between 1965 and 1975. Results showed that driver education is significantly and positively related to the licensing rate of 16 and 17 year olds. The results suggest that driver education probably accounts for at least some increase in the licensing of young drivers.

13. McKnight, A. James and Green, Molly A., Safe Driving Knowledge Dissemination and Testing Techniques, National Public Services Research Institute, National Highway Traffic Safety Administration, Washington, DC, 20590, May, 1977. (DOT HS-802 364)

Abstract: In order to determine the effectiveness of improved information dissemination and assessment techniques in reducing highway accidents, a set of seven targeted driver license manuals and tests were developed for the following groups of driver: New Drivers, Youthful Drivers, Renewal Applicants, Older Drivers, Traffic Violators, Accident Repeaters, and Drinking Drivers. The content of the manuals and tests were based upon an analysis of critical information requirements for each target group and an assessment of existing information deficiencies of drivers relative to these requirements. In addition to the manual, a one-hour audiovisual presentation covering the contents of the New Driver manual was developed for the reading disabled and mentally retarded high school students. The assessment of information acquisition evidenced knowledge gains for all target groups.

14. Waller, Patricia F. et al. Safety Belts: The Uncollected Dividends, Highway Safety Research Center, University of North Carolina, National Highway Traffic Safety Administration, Washington, DC 20590, 1977. (DOT HS-802 598)

Abstract: The study identified a variety of safety belt use inducing techniques for implementation by State and local government agencies. Most of the proposed techniques could be implemented within already existing authority, although a few would require at least limited legislation. Among the techniques proposed is one requiring all occupants of motor vehicles being driven by a driver under age 18 to use their restraint system.

15. Croke, Julie A. and Wilson, William B., Development of a Model System for Provisional (Graduated) Licensing of Novice Drivers: Final Report, Tecknekron, Inc., National Highway Traffic Safety Administration, Washington, DC, April, 1977. (DOT HS-802 313)

Abstract: This study reports on how a provisional licensing system was developed and includes a detailed description of its countermeasures, their objectives, and the rationale for them. The report also contains background information and data, a list of materials available for project use, and various support documents for the provisional licensing system.

16. McKnight, A. James and Simone, Gerry A., Integrated Safe Driving Information System Development, Volume III - State Guide, National Public Services Research Institute, National Highway Traffic Safety Administration, Washington, DC, 20590, February, 1978. (DOT HS-803 885)

Abstract: This publication provides suggested ways in which States can transmit safe driving information to its many drivers. It is intended primarily for State Highway Safety personnel. They are generally in the best position, by mission and capability, to coordinate the activities of State and local agencies that have contact with the driving public. The guide draws its contents from the "Plan," Volume II - System Plan (DOT HS-803 884), which provides more detail about the drivers, programs, and materials described in this publication.

17. McPherson, Kenard; McKnight, A. James; and Knipper, Anne; Development of an In-Traffic Test for Motorcyclists (MIT). National Public Services Research Institute, National Highway Traffic Safety Administration, Washington, DC, 20590, February 1978. (DOT HS-803 348)

Abstract: This report describes the development and preliminary evaluation of a set of in-traffic test procedures for motorcycle operators. The test that emerged from the design activities consists of 21 driving situations in the following categories: Observation, Signaling, Longitudinal Positioning, Lateral Positioning, and Gap Selection.

18. Anderson, James; Ford, Jack L.; Peck, Raymond C.; Improved Motorcyclist Licensing and Testing Project Executive Summary, California Department of Motor Vehicles, National Highway Traffic Safety Administration, Washington, DC, 20590, June 1980. (DOT HS-805 599)

Abstract: This report summarizes the final analyses and evaluation of the relative effectiveness of two improved motorcycle licensing programs compared to California's standard licensing program. The two improved programs were identical to each other with the exception that one required that drive test failures complete a remedial skills training program. The driver record analyses indicated a statistically significant reduction in motorcycle accident rates during the year after application in each of the two improved licensing programs in comparison with the present program. The magnitude of the accident reductions ranged from 15 percent to 21 percent. Both improved programs were cost-beneficial on all of the cost-benefit indices. A modified version of the improved licensing program (MOST II) has been developed and implemented.

19. California Department of Motor Vehicles, Development of a Provisional Licensing Program for New California Drivers, California Department of Motor Vehicles, Sacramento, California 95813, February, 1980. (DOT HS-030 049)

Abstract: This report documents the development of a provisional licensing program for original California driver's license applicants. The impetus for considering alternative licensing procedures was the high accident and traffic conviction rates characteristic of new drivers. An initial provisional licensing model was developed, following consideration of traffic safety literature on new drivers and a review of provisional licensing programs implemented or piloted in other states and countries. Further refinements were made following an analysis of comments solicited from a number of individuals in various traffic safety disciplines, and following an independent survey of California public opinion. It was recommended that a limited pilot be conducted with original applicants to determine the traffic safety effectiveness of the final program model. The primary model includes a one-year distinctive provisional license, a youth-oriented driver improvement program, various restrictions for young problem drivers, the encouragement of parental participation in training new young drivers, driver's manuals for new drivers, and a variety of operational changes, including a mandatory instructional permit. Other options and less comprehensive models with lower ongoing costs were also presented for management consideration.

20. National Highway Traffic Safety Administration, Motorcycle Operator Skill Test (MOST II) Users Manual, National Highway Traffic Safety Administration, Washington, DC, 20590, July, 1980. (DOT HS-805 183)

Abstract: This publication describes the off-street skill test developed for motorcycle operator applicants. This manual describes the MOST II designed for use by state agencies to assess license applicants' motorcycle riding skills. The test measures vehicle handling skills and is designed to be set up in an off-street paved area (such as a parking lot adjacent to the examining station). The area required for the test exercises is about 125 feet by 50 feet. Within the area, lines are painted to delineate each of the exercise areas. The system, which includes the Motorcycle Operator Manual and Knowledge Test, was demonstrated in California to reduce crashes 15-21 percent.

21. McPherson, Kenard and McKnight, A.James, Automobile Driver On-Road Performance Test, Volume I-Final Report, Volume II-Administrator's Manual, Volume III-Examiner's Manual, National Public Services Research Institute, National Highway Traffic Safety Administration, Washington, DC, September, 1981. (DOT HS-806 207/8/9)

Abstract: An Automobile Driver On-Road Performance Test (ADOPT) was developed and then pilot-tested in Oklahoma to assess its reliability and validity. This 10-minute test uses an objective scoring system and assesses specific performances at designated locations. It is primarily a measure of driver skill, which serves as an indirect measure of safe driving practices. It was found that there was a high correlation of applicant scores with the use of different examiners and different road routes.

22. Butler, Gary T., Effectiveness and Efficiency in Driver Education Programs, National Highway Traffic Safety Administration, Washington D.C. 20590, March 1982. (DOT HS-806 135)

Abstract: This report describes the history and current status of research in the driver education field.

23. Tannahill, Wayne J. and Tarrants, William E., Effectiveness and Efficiency in Driver Licensing and Improvement, National Highway Traffic Safety Administration, Washington D.C. 20590, March 1982. (DOT HS-806 136)

Abstract: This paper discusses 33 driver licensing and control countermeasures, nine with documented crash reduction capability.

24. American Association of Motor Vehicle Administrators, Driver Improvement System for Traffic Violators, American Association of Motor Vehicle Administrators and National Highway Traffic Safety Administration, Washington, DC, 20590, November 1982. (DOT HS-806 284)

Abstract: This publication, which is a part of the "Guidelines for Motor Vehicle Administrators" series, presents a driver improvement system geared to improving the performance of a traffic offender. The goal of the system is to reduce crashes and convictions. To reach this goal, the system was designed to meet the following objectives: (1) Identify drivers who have the greatest likelihood of being in a crash, (2) Carry out actions that will cause these individuals to drive more safely, and (3) Remove from the road those people who prove unable to improve their driving enough to assure a reasonable level of safety for others. Institutional objectives to be met by the system are: (1) it must treat traffic violators in a consistent, reasonable, and fair manner, (2) it must be cost-effective, and (3) it must recognize real-world limitations of power, purse, and personnel made available to administrators of driver improvement programs.

25. Preusser, David F., Williams, Allan F., Zador, Paul L. and Blomberg, Richard D., The Effect of Curfew Laws on Motor Vehicle Crashes, Dunlap and Associates East, Inc. and Insurance Institute for Highway Safety, Washington, D.C. 20037, September 1982.

Abstract: Twelve states in the U.S. have curfew laws, which prohibit young drivers from operating motor vehicles during late evening and/or early morning hours. The effect of such laws on motor vehicle crashes was studied in four of these states. In each state studied, the laws were found to substantially reduce the crashes of 16 year olds. Sixteen year old driver crash involvements during curfew hours were reduced by an estimated 69 percent in Pennsylvania, 62 percent in New York, 40 percent in Maryland, and 25 percent in Louisiana. Except in Maryland, the percentage of the 16 year old population licensed was lower in those states that had a curfew than comparison states. New York, which has the strongest curfew law, has the lowest 16 year old licensure rate in the U.S., and Pennsylvania is the second lowest. It is possible that curfew laws reduce early licensure, in which case reductions in crash involvements resulting from curfews may be even greater.

26. Weidman, J.R., Simone, G.A., and McKnight A.J., Development of a Driver Improvement System for Traffic Violators, Volume I - Developmental Research, Volume II - Program Materials, National Public Services Research Institute, National Highway Traffic Safety Administration, Washington, DC, 20590, January, 1982. (DOT HS-806 245/6)

Abstract: This study provides a model driver improvement system, guide materials for an education program designed for traffic violators and materials for a group meeting for traffic violators. Three eight hour courses are presented: Version A, a self-contained course; Version B, course incorporating existing audio visuals; and Version C, a four hour course augmented by four hours home study materials. A one hour group meeting is also provided for.

27. McKnight, A.J., Hyle, P. and Albricht, L., Youth License Control Demonstration Project, Maryland Department of Transportation and National Public Services Research Institute, National Highway Traffic Safety Administration, December 1983. (DOT HS-806 616)

Abstract: In 1977, the National Highway Traffic Safety Administration awarded a contract to the Maryland State Motor Vehicle Administration to implement and evaluate a model provisional licensing program. This Program was designed to control the manner in which beginning drivers acquire driving experience after initial licensing. The assumption upon which this program is based is that limitation to driving in low-risk situations, coupled with a period of supervised practice, would provide drivers with an opportunity to acquire the skills needed for safe and efficient driving under conditions which minimize threat to themselves and the public.

The effect of the Provisional License Program (PLP) upon accidents and violations was assessed through an interrupted time series design. Accident and violation data were collected for the four-year period prior and following introduction of the PLP in January of 1979. To help control for the effect of factors outside of the PLP, accidents and violations also were observed for Maryland drivers not subject of the PLP (ages 18-21) as well as equivalent age groups in the State of Virginia and across the Nation.

The major findings of the Maryland Youth License Control Demonstration Project showed a five percent reduction in crashes and 10 percent reduction in convictions for all 16- and 17-year old drivers. Because it is estimated that only about half of those in that age group were actually operating with provisional licenses at any particular time, the true effectiveness of this program, in terms of reducing crashes and convictions, may have been as high as 10% and 20% respectively, for drivers subject to the provisions of the PLP.

28. Stock, J.R.; Weaver, J.K.; Ray, H.W.; Brink, J.R. and Sodot, M.G.; Evaluation of Safe Performance Secondary School Driver Education Curriculum Demonstration Project, Battelle Columbus Laboratories, National Highway Traffic Safety Administration, Washington, DC, 20590, June 1983. (DOT HS-806 568)

Abstract: The primary objective of this project was to determine the crash reduction potential of a quality, competency-based driver training program known as the Safe Performance Curriculum (SPC). The experimental design called for the random assignment of 18,000 volunteer high school students in Dekalb County Schools, Georgia, to one of the following: (1) Safe Performance Curriculum (SPC) - a 70-hour course including classroom, simulation, range, and on-street training; (2) Pre-Driver Licensing (PDL) - a modified curriculum containing only the minimum training required to obtain a license, comparable to a state's 30+6 program; (3) Control - no formal driver education in the secondary school. The sample of students were monitored for a period of 2 to 4 years after assignment to assess measures of intermediate and ultimate performance. The primary measures of ultimate performance analyzed were the numbers and types of crashes and violations the students experienced in this time frame. Final detailed analyses showed a statistically significant short-term program effect, with SPC and PDL groups having significantly lower crash and violation means during the first 6 months of licensed driving. However, with an increasing time period of observation, the comparative relative differences between group means decreased and were not statistically significant. Moreover, the short-term effect was additionally offset or neutralized by the earlier licensing of SPC and PDL group students, yielding a net effect of no statistically reliable differences among SPC, PDL, and Control groups of students in overall crash and violation means.

29. McPherson, K.; McKnight, A.J.; and Oates, J.F.; Development of Knowledge and Performance Tests for Heavy Vehicle Operators, Volume I: Development and Field Test, Volume II: License Administrator/Examiner Manuals, National Public Services Research Institute, National Highway Traffic Safety Administration, Washington, DC, 20590, December 1984. (DOT HS-806 688/9)

Abstract: This report contains the materials making up the Truck Operator Qualifications Examination (TORQUE). These materials include: Truck Operator Road Test (TORT)--A measure of truck operator skill administered on streets and highways; Truck Operator Skill Test (TOST)--A measure of truck operator skill administered in an off-road environment; Truck Operator Manual (TOM)--A manual setting forth laws and safe driving practices for operation of trucks; Truck Operator Knowledge Examination (TOKE)--A 96-item multiple-choice test assessing knowledge of the information provided in the TOM; and Truck Operator Pretest (TOP)--A hands-on test of pre-trip inspection and coupling/uncoupling of tractor-trailers. One additional test, the Truck Operator Defects Examination (TODE) consisting of a series of 35mm transparencies also was developed but is not included in this manual.

30. Motorcycle Safety Foundation, Motorcycle Operator Licensing System, Motorcycle Safety Foundation, Costa Mesa, California 92628, 1984.

Abstract: This document has been written for motor vehicle administrators who wish to improve the effectiveness of their state's motorcycle operator licensing program. It presents what is intended to be the optimal system - one that strikes a workable compromise between what research indicates should be done and what experience shows can be done, given the constraints of money, personnel and authority available to administrators.

31. Garys, P.; Pang, H.C.; Rosenbaum, R.M.; Preliminary Evaluation of the Probationary Driver Program in Ontario, Ontario Ministry of Transportation and Communications, 1201 Wilson Avenue, Downsview, Ontario M3M 1J8, October 1983.

Abstract: A report on the Ontario Probationary Driver System, which requires two separate one year periods of driving without a suspension, which occurrence at less than half the points needed for regular drivers to be suspended, presented preliminary evidence of the program's effectiveness. It was found that there were nine percent fewer crashes and 14 percent fewer offenses for the probationary drivers, and the crash rate was down seven percent and the offense rate was down 11 percent for male drivers under 20 years of age.

32. Ministry of Transport, A Graduated Driver Licensing System, Ministry of Transport, Wellington, New Zealand, July 1985.

Abstract: A "graduated driver licensing system" is proposed for New Zealand's young, novice drivers which provides for a three or four stage licensing system. The Learner Stage would be six months and require that the holder of the permit be accompanied by a full license holder and have a zero blood alcohol limit. During the Restricted Stage the holder could not drive unless accompanied by an adult supervisor during the period 9 pm to 5 am, carry no passengers without adult supervision and have a zero blood alcohol limit. An alternate third stage is presented which would require a "clean conviction record" for five consecutive years prior to full licensure.

33. Liddicoat, C.M.; Marsh, W.C.; Development of a Comprehensive Evaluation Design and Data Collection System for Assessment of Provisional Licensing, Research and Development Office, California Department of Motor Vehicles, Sacramento, California 95813, October 1985.

Abstract: The legislation which created California's Provisional Driver Licensing (PDL) Program mandated an evaluation of the traffic safety effects. This report describes the quasi-experimental design which was necessitated due to the program being implemented statewide all at once. Future reports (to be presented to the State Legislature in July 1986 and December 1988) will include analyses and conclusions about the impact of the PDL program.

34. Tannahill, Wayne J., Provisional Driver Licensing System for Young Novice Drivers, National Highway Traffic Safety Administration, Washington D.C. 20590, December 1985. (DOT HS-806 891)

Abstract: This paper presents NHTSA's proposed provisional driver licensing system designed to ease novice drivers into the driving environment through more controlled exposure to progressively more difficult and hazardous driving experiences prior to full licensure. Under this system, novice drivers would be required to demonstrate responsible driving behavior over a specified period of time. The Maryland Department of Motor Vehicles has implemented and evaluated a part of this provisional licensing system, which produced a 10 percent reduction in traffic convictions and a five percent reduction in crashes during the first six months of the provisional operator's driving experience.

35. Hagge, Robert A. and Marsh, William C., An Evaluation of the Traffic Safety Impact of Provisional Licensing - Interim Report to the Legislature of the State of California, California Department of Motor Vehicles, Sacramento, California 95813, July, 1986.

Abstract: The California Provisional Driver License Program for drivers under 18 years of age commenced October 1, 1983. This interim report addresses the program's short-term impact on the total, fatal and injury, and single-vehicle accident rates among 15-17-year-olds in California. There is suggestive evidence that provisional licensing prevented what otherwise would have been a 13.17 percent increase in the fatal and injury accident rate. This represents a yearly accident avoidance of approximately 2.3 serious accidents per 1,000 15-17-year-olds, or a total of 2,540 accidents each year. The estimated cost of each accident prevented is \$106. The final report is due December 31, 1988.

36. O'Conner, P. J., Report on Graduated Driver Licensing and Other Road Accident Countermeasures focusing on Young Drivers, Road Safety Division, Adelaide, Australia 5001, November, 1986.

Abstract: This project sets out to assess the nature and extent of the young driver problem and to recommend appropriate road accident countermeasures for implementation in South Australia. In particular, it assessed the concept of graduated licensing and the graduated driver licensing scheme recently outlined by the Federal Office of Road Safety.

Among the countermeasures suggested were the use of a night-time restriction on 16 and 17 year old drivers, raising the minimum age to 17 for obtaining a probationary license and extending the probationary license period from 12 months to 24 months.

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